THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIX. No. 729.] LONDON, MAY 1, 1877. [29TH YEAR.] Price 6d.

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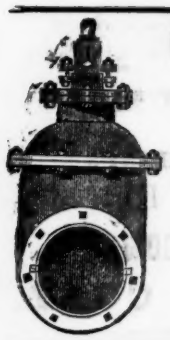
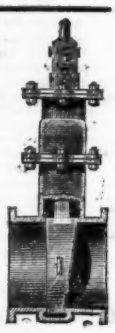


C. & W. WALKERS' DOUBLE-FACED GAS-VALVES.



These solidly constructed double-faced Gas-Valves have taken the place of the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

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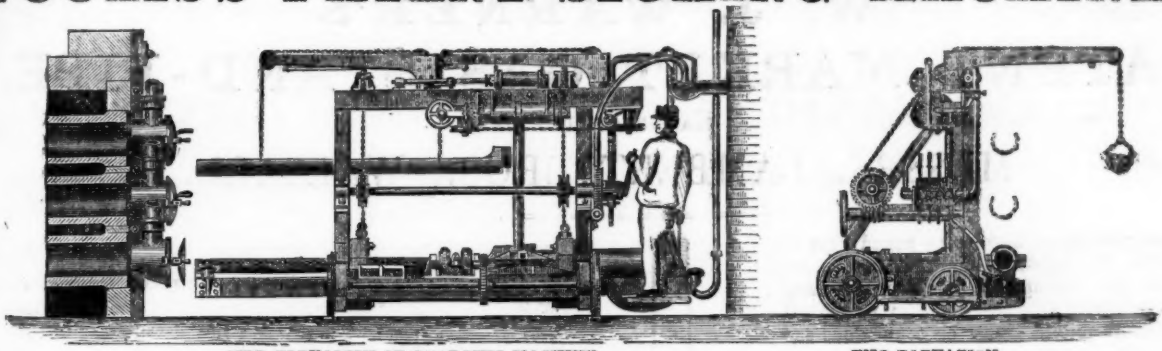

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(*The Drawing Machine will be Illustrated in next week's Advertisement.*)

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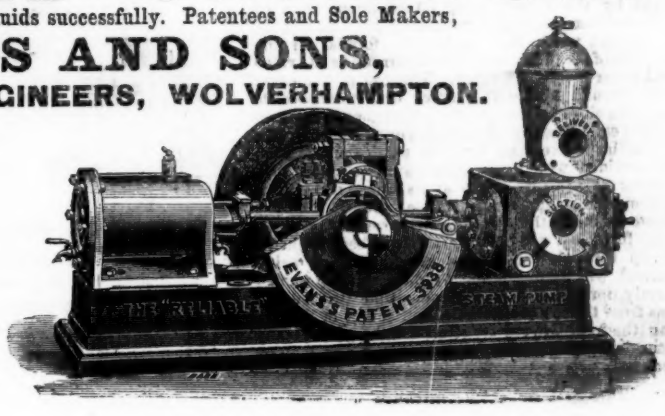

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The apparatus consists of a vertical pipe, the lower end of which is fixed to the main or collar, and the upper end to a box like a common syphon-box. Into this box is fastened a plate having a plug or valve thereon. The valve or barrel is fitted to a fixed seat or plug capable of turning upon it, and is square on the outside, and of such size as to fit a collar made to slip over it, the joint between the collar and the plug being made gas-tight by the former being forced down upon an india-rubber washer, by certain projections coming in contact with other projections formed in the interior of a cap or cover which surrounds the valve and collar before described. The top of the cover has a round hole with a notch or key-way on its opposite sides to admit of the projections or feathers on the collar passing through and on to the plug. To the collar is fixed the stand or service pipe, which is provided with an ordinary stopcock and gas-burner or pressure-gauge at its upper end. The action of the apparatus is simple. When it is desired to make the attachment, a service or stand pipe furnished with a collar, as described, is thrust down through the cap or cover, and, on being turned, will fix or jam itself tightly, so as to remain firmly upright, and at the same time turn on the gas from the main beneath. The action of removing the pipe effectually shuts off the gas, thereby ensuring great security against fraud, and loss by leakage.

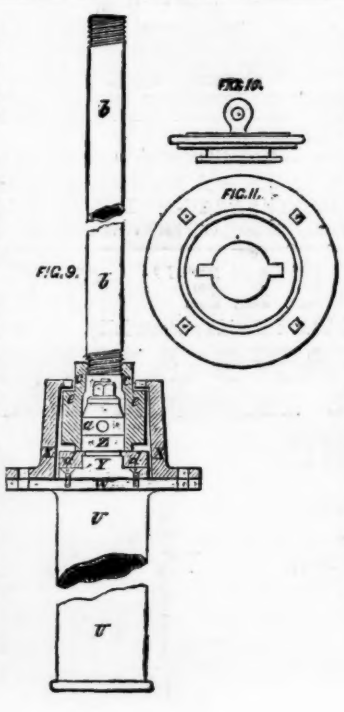

Fig. 9 represents the arrangement for the attachment of removable market or other gas stand-pipes. The view is a side elevation and part section. To the top of the service, U, is fixed a plate, W, and upon that is fastened by bolts the case or box, X. To the plate, W, is also fixed, by screws, the plug or valve, Y, and upon this plug the barrel Z is free to turn. That part of the barrel marked *a* is square. The stand-pipe, *b*, has attached to its lower end the collar, *c*, which is square in the interior, so as to slip over and turn the barrel by the square part, *a*, until the hole in the plug and that in the barrel coincide, when a gas-way will be established between the service, U, and the stand-pipe, *b*. A gas-tight joint between the collar, *c*, and the plate of the plug or valve, Y, is made by the former being forced down upon an india-rubber washer, *d*, by the upper part of the feathers, *e*, of the collar, *c*, coming in contact with inclined projections cast on the inner side of the box, X.

Fig. 10 is a plan of the top of the box or case containing the valve.

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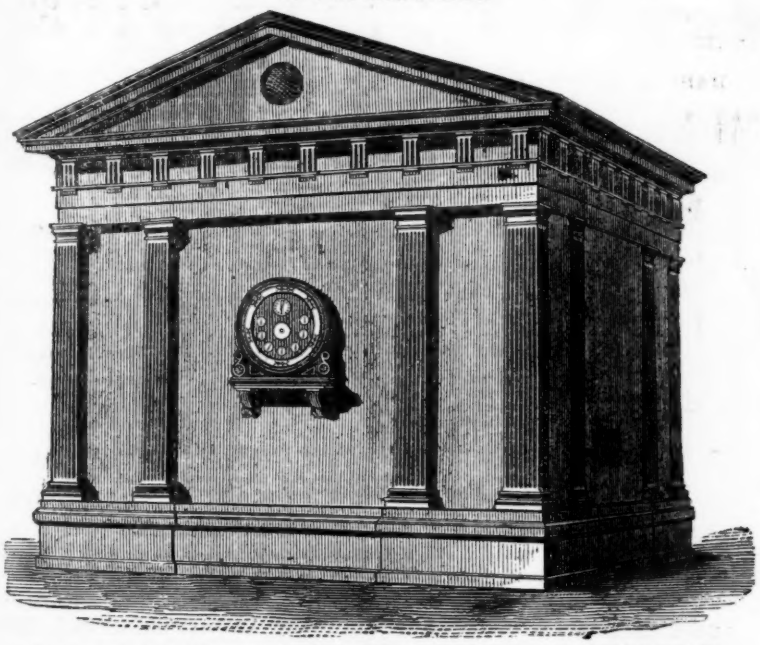

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All other Colours made to order.

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A great variety of Colours ready mixed for the brush are also always kept in Stock, in 3 lb., 7 lb., 14 lb., and 28 lb. cans.
Prices and Testimonials on application.

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AND FOR THE
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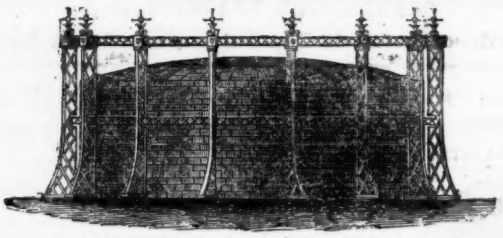

THE HORSELEY COMPANY,
LIMITED,
TIPTON, STAFFORDSHIRE.
LONDON OFFICE:
6, WESTMINSTER CHAMBERS, VICTORIA STREET,
GAS ENGINEERS, IRONFOUNDERS, &c.,
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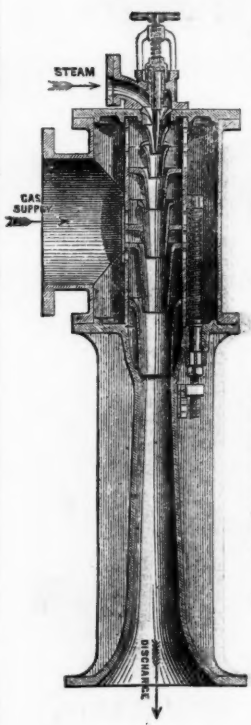
GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,
AND ALL REQUISITES FOR EITHER
GAS OR WATER WORKS;
ALSO
MAKERS OF ROOFS, BRIDGES, &c.

KÖRTING BROS.,
Steam-Jet Engineers,
7 and 17, LANCASTER AVENUE,
MANCHESTER,
AND 40, LOWER GARDINER STREET, DUBLIN.



E. KÖRTING'S PATENT
STEAM-JET GAS-EXHAUSTER.
IMPROVED CLELAND'S PATENT.
Small Cost—Compactness—Perfectly Self-Acting—Self-Regulating—Self-Cleansing—No Steam-Engine—No Attention—No Extra Room Required—No Wear and Tear—No Noise—No Oscillation in Vacuum, or Back Pressure.

UPWARDS OF 200 IN USE.
SUPPLIED TO—

Chartered Gas Co.	Glasgow Corporation.	Hanna, Donald, and Wilson, London.
London Gas Co.	Leyland Gas Co.	Ratcliff Gas-Works.
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Phœnix Gas Co.	Lincoln Gas-Works.	Longton Gas Co.
Liverpool Gas Co.	Birmingham Gas-Works.	Dartford Gas Co.
Bolton Corporation.	Wakefield Gas-Works.	Exeter Gas Co.
Horsham Gas Co.	Brentford Gas-Works.	Harrogate Gas Co.
Epsom and Ewell Gas Co.	Burnley Gas-Works.	Hertford Gas Co.
Ipswich Gas Co.	Guildford Gas-Works.	Waterside Gas-Works, Todmorden.
Cheltenham Gas Co.	Gloucester Gas-Works.	F. W. Grafton and Co., Accrington.
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E. KÖRTING'S PATENT STEAM-JET REVIVIFYING BLOWERS FOR THE PURIFYING MATERIAL.

SOLE LICENSEES FOR
W. CLELAND'S PATENT STEAM SCRUBBER AND SLOW-SPEED CONDENSER.

FOR PARTICULARS, APPLY TO
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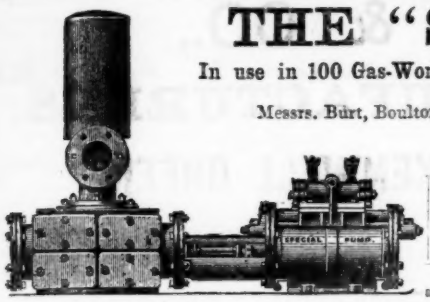
and 40, Lower Gardiner Street, Dublin,
OR TO
GERALD J. TUPP, 8, John Street, Adelphi, W.C.,
LONDON,
SOLE AGENT FOR ENGLAND AND WALES.

THE "SPECIAL" STEAM-PUMP.

In use in 100 Gas-Works in the United Kingdom for Pumping Ammoniacal Liquor, Water, or Tar.

Messrs. Burt, Boulton, and Haywood, Manufacturing Chemists, have FORTY "Special" Steam-Pumps in use at their several large Tar-Works.

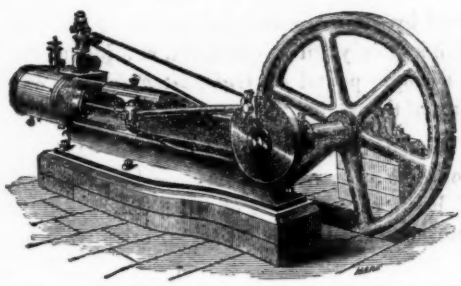


200 Sizes made. The following are the Leading Sizes for Gas-Works:—

Steam Cylinder . . .in.	3	4	3	5*	5*	4	6*	5	7*	6	8*	7	10*
Water Cylinder . . .in.	1½	2	3	2½	3	4	4	5	5	6	6	7	7
Gallons per hour . . .	450	815	1630	1250	1630	3250	3250	5070	5070	7330	7330	9750	9750
Price	£18	£18	£18	£21	£22½	£25	£30	£32½	£40	£40	£50	£50	£65

* These Sizes being usually selected for pumping Tar and Liquor, are always in stock, or nearly ready, fitted with all pump details in iron, and extra length distance-piece between steam and pump cylinder, at a small extra cost.

TANGYE'S HORIZONTAL HIGH-PRESSURE STEAM-ENGINES.



THE DESIGN,
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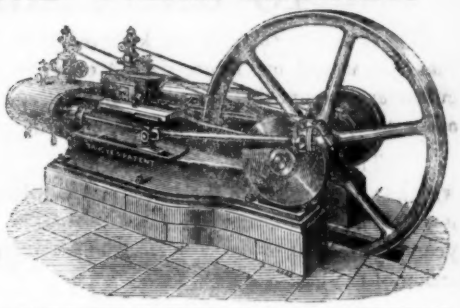
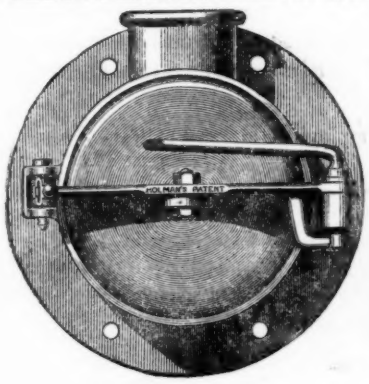
OF THESE ENGINES
HAVE CALLED FORTH
UNIVERSAL APPROVAL.

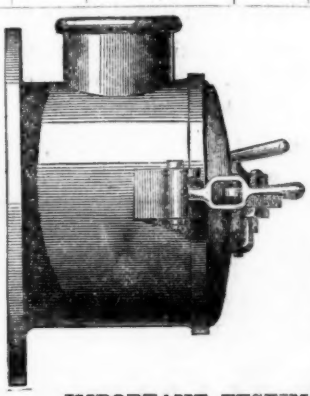
Over 2000 Sold

Since December, 1869.



SIZE	B	C	D	E	G	H	I	J	K	M
Nominal Horse Power	TWO	THREE	FOUR	SIX	EIGHT	TEN	TWELVE	FOURTEEN	EIGHTEEN	TWENTY-FIVE
Price of Engine, with Governor	£28 0	£38 0	£46 0	£70 0	£99 0	£115 0	£127 0	£140 0	£195 0	£220 0
Feed-Pump, extra	3 0	3 15	4 0	5 10	6 0	7 10	7 10	8 0	10 0	15 0
Variable Expansion Gear, extra	..	..	..	..	13 0	14 0	15 0	15 0	20 0	25 0





MORTON'S
Patent Self-Sealing
RETORT LIDS,

WITH

HOLMAN'S NEW PATENT BRACKETED CROSS-BARS, ANTI-FRICTION CATCHES, AND ECCENTRIC FASTENINGS.

Instantaneous Sealing effected. No Luting. No Duplicate Lids required. Holman's New Self-Sustaining Cross-Bar ensures freedom of joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested (rigid cast iron is now successfully employed), nearly 25,000 being in use at various Gas-Works in London and the Provinces.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (commonly called the Chartered Gas Company), Beckton, North Woolwich.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them. I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly, (Signed) G. C. TREWEY.

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

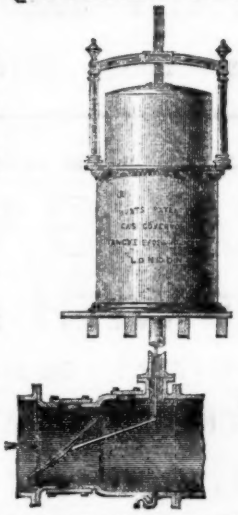
Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.



These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dronfield, Dursley, Exeter, Guernsey, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

Yours truly,

(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION TO

TANGYE BROTHERS & HOLMAN,

SOLE MANUFACTURERS,

LAURENCE POUNTNEY LANE, LONDON, E.C.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

TO GAS ENGINEERS AND MANAGERS.

It having come to our knowledge that a report is in circulation, spread by some unprincipled person or persons, that the cases of our larger-sized Meters are made of Galvanized Iron, we think it only fair to ourselves, and just to our customers, to say, that we never have used, in making any of our Meters, a single pound of *Galvanized Iron*, or any other *cheap* and *inferior material*, and this can be easily seen by opening any of them.

The cases of our large-sized Meters, from 20 lights and upwards, are all made of the very *Best Best Patent Alloy*, which is nearly double the price, and will last more than double the time, of some other material that has been and still is very largely used for the same purpose. And our experience, acquired by an extensive use of it for upwards of 30 years, enables us to say with confidence that no other metal in use for the purpose is so little liable to corrosion from the action of the gas.

We have now in use a Meter made in 1848, and therefore 29 years old, the case of which is made of Patent Alloy; the Meter is still in perfect order, and shows no signs of decay.

The utmost care is exercised by us in selecting none but the very best materials for all parts of our Meters; much of it is made *expressly for us*, as it is not possible to obtain it in the open market of the same superior quality.

The great fall in the price of all materials used in making our Meters has enabled us to give an increased discount, thus giving our customers the benefit of the fall. This we were bound in fairness to do, as we raised the price of our Meters four years ago, when the price of all metals went up.

It will be our constant endeavour, by using none but the best materials, and employing the most skilful workmen, to maintain the high character our Meter has hitherto borne.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

LECTURES ON THE CHEMISTRY OF GAS MANUFACTURE.—*The fourth and last lecture delivered by Mr. Vernon Harcourt has been necessarily postponed, but we hope to publish it next week.*

C. B.—*Ammoniacal liquor extracts sulphuretted hydrogen better than pure water, but pure water will extract more ammonia than liquor.*

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MAY 1, 1877.

Circular to Gas Companies.

THE great "sulphur" fight commenced yesterday, when the Bill promoted by the Crystal Palace District Gas Company came under the consideration of the Committee of the House of Commons. It will be remembered that the object of this Bill, as also that of another, promoted by The Gaslight and Coke (Chartered) Company, is to get rid of the obligation, whether imposed by statute or by order of the Gas Referees, to keep the amount of the "sulphur" impurity in gas within certain specified limits. The questions the committee will have to decide may be briefly stated as follows:—(1) Have the Gas Companies at the present moment, at their command, means and processes whereby they can, with regularity and certainty, keep the amount of "sulphur" impurity within any given limit? (2) If there are processes capable of achieving this result, are they such as can be employed without causing annoyance or nuisance? (3) Is the amount of sulphur present in gas as ordinarily purified, (30 to 40 grains per 100 cubic feet), a source of danger to health, or the cause of damage to property? To answer these questions in the negative and the affirmative, a vast amount of talent will be employed. We shall not, of course, attempt to anticipate the evidence which will be given on either side. Some of it, however, we may say, must be similar to that taken before Sir J. Trollope's committee in 1866, the Bill then under consideration containing the first suggestion of Chemical Referees, who were to have the power of fixing a sulphur maximum according to circumstances. But the inquiry this year will, we have reason to believe, be of a much more extensive and exhaustive character than that of 1866, and a vast amount of information will be communicated, which cannot fail to be of the highest interest to Gas Companies.

There is one point to which we may refer, because it is not a matter of opinion, but of fact. There are now considerably over a hundred gas undertakings, regulated by Special Acts, in the hands of Local Authorities, and it is remarkable that only two of these Acts contain clauses restricting the amount of sulphur to be allowed in the gas. It will be remembered, too, that the Corporation of the City of London and the Metropolitan Board of Works have promoted Bills to acquire or set up gas-works; neither of these authorities, in their Bills, proposed to place themselves under restrictions as to the quantity of sulphur. The immunity claimed by a Corporation or Local Authority may be fairly claimed by a Gas Company; but the Committee must draw their own inferences from the facts and opinions which will be laid before them.

It is hardly necessary for us to say that our opinion respecting auction clauses is unchanged. We continue to regard them as a distinct violation of the established rights of existing shareholders. Nor are we more in love with the sliding scale, which we look on as something like a delusion to shareholders, and as not unlike a mockery to the public, who wish to be supplied with gas at the lowest rate possible. The two, however, taken together, seem to be accepted as a satisfactory settlement of the question of the day, and we need not persist in objections. We may remark, however, that the views put forward by Mr. G. W. Stevenson, in the letter we published last week, are somewhat peculiar. "Auction clauses," he says, "for new capital, a fair "standard price for gas, *subject to revision from time to time*, and "a sliding scale of dividend . . . supply the antidote for nearly "all the complaints brought against Gas Companies," &c. Now, this idea of a revision of price in connexion with the sliding scale is worth looking into. We know—that is, we feel confident—if ever a Gas Company should pay much more than what we must call the standard dividend, the public would call out for a revision of price. Similarly, if the dividends of a Company fell below the standard, they, too, would demand a revision. But, in either case, what would become of the sliding scale? Surely, revision clauses and the sliding scale are a contradiction in terms.

It will be seen in our "Parliamentary Intelligence" that the Bill of the Ramsgate Local Board, which was thrown out by the committee, has been revived and recommitted, the Gas and Water Companies and the Board having, at the last moment, come to an agreement. We need not speculate on the causes which have brought about the arrangement. Mr. Raikes's new Standing Order may or may not have had something to do with it, and it may have been considered that the proposed Improvement Stock would be much reduced in amount. In any case, as the matter now stands, and subject to the approval of the committee, the Gas Company have agreed to sell, and the Local Board have consented to purchase, the Ramsgate portion of the Isle of Thanet Gas Company for the lump sum of £65,000, the Company still retaining the Margate portion. We do not suppose that any obstacles to the completion of the purchase will arise. The price agreed upon may be considered fair, if not liberal.

The shareholders in the Leicester Gas Company have unanimously approved of the sale of the undertaking to the Corporation on the terms proposed, so that nothing more remains to be done but to carry out the arrangement made.

The Bill of the Dukinfield and Denton Local Boards, containing clauses authorizing the purchase of the gas undertaking of the Company, has passed the committee, and the Ashton-under-Lyne Improvement Bill has also passed, but with the clauses by which the Local Board sought power to make a compulsory purchase of the Ashton-under-Lyne Gas Company struck out. The Gas Company were successful with their Bill, and, as the originators of auction clauses, we must say they deserved to be. If the choice is to lie between compulsory purchase and auction clauses, we shall certainly go in for the latter.

We cannot help thinking that some check has been given to the rising "enterprise," as some may call it, of Corporations, by the recent failure of the Corporation of Birmingham to raise a loan of a million and a half. It was to bear interest at the rate of 3½ per cent., and was offered at 93, but investors failed to

respond to the invitation. When the tenders were opened at the Bank of England, the amount subscribed was found to be utterly insufficient, and the loan is withdrawn for the present. The causes assigned for the failure are various. The price was too high, the interest too low; a delay, for which the Local Government Board are considered responsible, occurred; and, finally, a war panic had supervened. It has not, however, been suggested that the increasing indebtedness of Local Authorities is beginning to excite apprehension in the minds of thoughtful men. Before the tenders were opened, and doubtless before they were written, Mr. Sclater-Booth had made his statement on the debts of Municipalities, and Mr. Chamberlain had commented thereon. The figures were ominous. At the close of the past year, the local debts amounted to just about a hundred millions. By the end of the current year it is estimated that they will amount to a hundred and five millions. A debt which increases at the rate of five millions a year cannot but be regarded as of serious import. A million and a half to Birmingham may be considered a trifling affair. The borough is well able to bear the burden, but as the money was to be expended on productive works, no burden would really have been incurred, except, we may say, for a sinking-fund, to pay off the loan, against which Mr. Chamberlain protests. Why, he asks, should loans to Municipalities be paid off? The answer is apparent enough; but to discuss this question in all its relations would lead us too far from the limited field we propose for ourselves. We only notice the failure of the Corporation of Birmingham because it may be followed by important consequences. The Public Works (Loans) Commissioners cannot fail to note this very decided expression of opinion on the part of the investing public, and they may possibly be induced to ask for money something nearer its market value for long investment. When a Corporation like that of Birmingham offer a loan at three-and-a-half per cent. below the market price of Consols, and fail to get the money, on what terms should a dead-and-alive place like Ramsgate obtain a loan?

We have received an abstract of the Gas Accounts of the Corporation of Salford, for the year ending the 30th of June last. The undertaking has been so far successful that it appears to have produced, on the year's working, a net profit of 10s. 7d. Without at all intending it, the Gas Committee have managed the undertaking on the principle we advocate, and we are bound to congratulate the Corporation on the result achieved.

We see, with pleasure, a movement in progress among the shareholders of the Alliance and Dublin Gas Company, to raise funds for a testimonial to their energetic Secretary and Manager, Mr. W. F. Cotton. He well deserves one from the hands of the proprietors. To have lifted that Company from the financial position they occupied, only a few years ago, to a ten-per-cent. paying concern, is no mean achievement. Mr. Cotton's efforts have more than doubled the market value of the shares, and the proprietors can well afford to be liberal.

Writing of personal matters, we may mention here that Mr. R. H. Patterson, the ex-Referee, has lodged an appeal in the House of Lords against the decision of the Lords Justices in the case of *Patterson v. The Gaslight and Coke Company*. This is a final appeal, and will, once and for all, decide the question of the validity of the plaintiff's patent for the purification of gas.

The West of Scotland Association of Gas Managers have just held a very successful Annual Meeting. While waiting for a full report of the proceedings, we may note that one of the most important communications made was the report of a committee appointed to investigate Aitken and Young's process for enriching gas. The committee speak of the process in very high terms, and the general opinion of the meeting was strongly in its favour. The report caused some revulsion of feeling among the members, and the retiring president, Mr. Monk, recalled the opinions he formerly expressed as to the advisability of reducing the standard of illuminating power in Scotland. With the short report before us, we do not appreciate his reasons. Westwood shale is not more likely than cannel to last for ever, and what then? Some other communications of much interest were made—all of which we hope to have the pleasure of laying before our readers—and the Association adjourned, to meet next at Helensburgh, under the presidency of Mr. James M'Gilchrist, of Dumbarton.

We may call the attention of our readers to a very useful publication which has just been issued in the shape of a "Gas and Water Companies Directory."* It contains a list of English undertakings, with the dates of their formation, the names of the chairmen, secretaries, and engineers of the several companies, the capital employed, the population within the limits, and other items of useful information. To Gas and Water Companies, and all doing, or proposing to do, business with them, this compilation will prove of much value, and we wish the Editor every success in his enterprise.

A conciliatory letter to the Board of Trade, signed by two of the Referees, will, we should hope, go far to allay the irritation caused in the camp of the Chartered Company by the letter to which Mr. Phillips rather fiercely replied. Uniformity in working is, undoubtedly, desirable; and when it is seen that at one station an operation can be conducted without causing a nuisance, while at another a nuisance is produced by a similar operation, the Referees might fairly consider it just ground for comment—a proof of the want of a controlling mind.

The Stretford Gas Company have been the first victims of enforced auction clauses, but a modicum of mercy has been shown to old shareholders. The Company have obtained power to raise £61,000, and of this Mr. Raikes has allowed £11,000 to be allotted to existing holders, while the remaining £50,000 are to be offered by auction.

* "The Gas and Water Companies Directory for 1877." Edited by C. W. Hastings. Marcus Ward and Co.

Water and Sanitary Notes.

In our innocence, we have more than once counselled Local Authorities to rely on the Local Government Board for guidance as to the mode in which they should dispose of their sewage. Our reasons for giving this advive have been various, and need not be recapitulated. Recent proceedings, however, before the Committee on the Improvement Bill of the Bolton Corporation seem to show that consulting the Inspectors of the Local Government Board may be a source of perplexity. The Corporation, we must assume, had more than one scheme before them for the disposal of their sewage, and the usual inquiry was held before Mr. Harrison, one of the Engineering Inspectors, who reported his approval of one of the projects. The Corporation apparently did not coincide with Mr. Harrison's opinion, for they called to their advice, in a private capacity, another Engineering Inspector of the Local Government Board, Major Tulloch, who, the other day, gave evidence against the scheme sanctioned by his colleague. Now, this sort of thing will not do at all. We hope the attention of the House of Commons will be called to the fact, that one Inspector in a private capacity has given evidence against a decision by another Inspector in an official capacity, and that we may get from the President of the Local Government Board some explanation of the duties and responsibilities of these gentlemen. To our minds, private practice on the part of the Inspectors is clearly incompatible with the quasi-judicial functions they are called upon to exercise. We might as well have judges practising at the bar, and criticizing the decisions of their colleagues.

The Select Vestry of Richmond (Surrey) appear to be in a worse mess than ever as regards the supply of water to the town; and the inhabitants, provoked beyond endurance, have resolved on invoking the interposition of the Local Government Board for the redress of their grievances. We hope no conflict of evidence on the part of the Inspectors will ensue. In the absence of the opportunity of personal observation, we have to rely on the reports of contemporaries, and from these it would appear that, in most parts of the town, water is now turned on for a few hours every other day—the result, as stated by one inhabitant, being that he had a supply of about fifty gallons a day for a family of twelve persons. One well on which the Vestry placed some reliance has already given out, and the pumping-engine has been removed to a shallow well, sunk in the sand in the Petersham meadows, the water from which is said to be pumped direct into the mains. The Vestry assert that the water furnished by this well comes from the "hills," in which case it must be surface water; others maintain that the well is filled by percolation from the Thames. In that case, the water is liable to contamination by sewage coming down the river from Kingston and other towns, and also—the intake, as we may call it, being within the tidal area—by sewage brought up by the tide from Barking and Crossness. No wonder the inhabitants protest. It is said that the reservoir has at last been filled; but, if so, it must have been with dirty surface water from the Leg of Mutton pond, which is not, as yet, considered fit for distribution. We do not pretend to be the apologists of the Southwark and Vauxhall Water Company; but we may express a strong opinion, that a greater *fiasco* was never made than this of the Select Vestry of Richmond.

We see, without astonishment, that the Liernur system, so favourably reported on by Mr. Haywood, the Engineer of the City Commissioners of Sewers, is not, at present, to be tried within the City of London, which is considered so completely sewered, that the Commissioners did not feel justified in going to any expense in making a trial of the system. We may, how-

ever, point out that the projected application of the Artizans, &c., Dwellings Act to the neighbourhood of Golden Lane, as elsewhere, offers the opportunity of isolating the sewage of a considerable population at a small expense; while, under efficient engineering advice, recourse may be had to the main sewage conduits, if Captain Liernur's system should prove a failure.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

CXXXIII.

SERVICE-PIPES (*continued*).

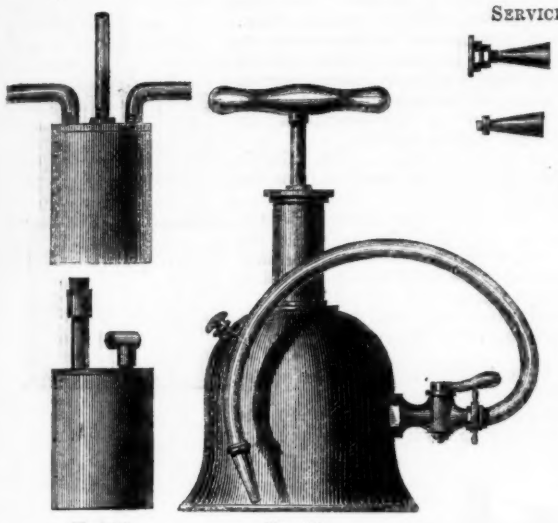


FIG. 14. FIG. 15.

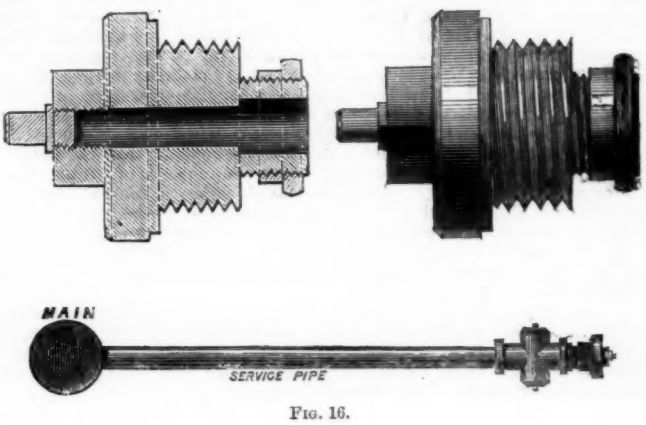


FIG. 16.

We spoke last week of the great importance of having uniformity of screw-pitch in the manufacture of service-pipes and fittings. The following table will be found useful in connexion with this subject:—

Pitch of the Whitworth Taps and Dies for Gas Tubing.

Diameter of tube in inches	⅛	¼	⅜	½	¾	1	1¼	1½	1¾	2
No. of threads per inch	28	19	19	14	14	11	11	11	11	11

No gas company, or local authority supplying gas, should allow the control and work of service-laying to pass from the hands of their own responsible servants into those of independent gas-fitters. The work is too important to be so delegated. Every division of a gas manager's duties calls for the display of skill and constant watchfulness, and the exercise of these qualities in this, as in other departments, is fully repaid.

In laying service-pipes, the socket supplied with each length should always be removed, the thread painted with red lead, and the socket replaced.

The holes in mains, for the insertion of the service-pipes, should invariably be drilled, not gouged or cut with a chisel, as is too frequently the rule. In drilling, when this is carefully done, the full thickness of metal is retained all round the hole, and this is true in outline; whereas in cutting with the chisel it is impossible to ensure a mathematically correct circle, or to avoid breaking pieces off the inner edge, thereby reducing the thread-area necessary for making a satisfactory joint.

Before inserting the pipe, a thin back or check nut should be run on the end, along with a galvanized india-rubber or felt washer, and when the service-pipe is screwed up, this nut is gently tightened against the main, its effect being to ensure a better connexion by causing a closer contact of the threaded surfaces than is otherwise attainable. To simply screw the service-pipe into the main is not a satisfactory method of jointing. A brass ferrule, having a shoulder and coupling screw, is used for the same purpose, but this adds to the cost without securing a better result.

It is desirable in service-pipes to have as few joints as practicable, and, therefore, the several lengths should be as long as can be conveniently placed.

The pipe, throughout its length, should be firmly bedded, to avoid settlement, with the risk of drawing the thread, or the danger of producing slack places and the lodgment of water.

The iron service-pipe should be carried through the wall of the building to be supplied, and the part within the wall painted with tar, to prevent oxidation; its end should then be carefully secured with a cap, rendered gas-tight with red-lead paint, until required to be connected with the stopcock and the meter.

It is advisable sometimes to insert a short piece of pipe—say 10 or 12 inches in length—having a long screw or running thread on one of its ends, near to the junction of the service with the main, for convenience in disconnecting the pipe, in case of an enlargement of the mains. This expedient obviates the necessity of much opening of the ground to reach the first joint in the service-pipe.

Wherever practicable, the service-pipe should have a slight rise from the main, and, when this cannot be accomplished, a small cast-iron syphon-pot or receiver, fig. 14, must be placed underneath it at the lowest point, to allow any water to drain into it. This may be either occasionally pumped dry with a hand pump, or a screw-plug may be inserted in the bottom of the vessel, which, on being removed, will permit the water to escape.

Abrupt-angled elbows should be avoided as far as possible, as tending to produce eddies, and interrupt the even flow of the gas; circular bends are preferable, wherever they can be employed; but bends of every kind should be dispensed with, if a straight length of pipe can be made available for the supply.

Most companies lay the service-pipe from the main, through the wall of the consumer's premises, free of charge, if the distance does not exceed 8 or 12 yards, except in the instance of passing through private property, when a charge is made for the work and materials.

The renewal of service-pipes, when they have been long in use, should be systematically carried out. The cost of doing this will be repaid by the diminished leakage.

Obstructions, such as naphthaline, grit, water, or rust, in service-pipes, are readily driven forward into the main by means of the service-cleanser of Messrs. D. Hulett and Co. This is represented in fig. 15, and consists of a strong bell-shaped vessel, to the top of which a force-pump is fixed. A strong flexible tube, tapered at the end, to fit into the pipe to be cleaned, is attached to a branch in the side, fitted with a stopcock. The pump or syringe is then worked, and the vessel charged with compressed air, and on the stopcock being suddenly opened, the rush of air removes the obstruction.

This service cleanser, at the suggestion of Mr. Mann, has been improved by fixing a bent pipe inside the air-vessel from the cock, by which it is made available for discharging about a gallon of water with great force through the service-pipes into the main.

The cleanser may also be used for the internal fittings of a house, but, in so applying it, care must be taken to remove the meter and the hydraulic slides previous to attaching the apparatus.

Another useful contrivance for the like purpose has been invented by Mr. Goldsmith, shown in fig. 16. It consists of a hollow brass nipple with shoulder, and screwed for attaching to the pipe socket. In using the cleanser, it is filled with ordinary gunpowder, and the opening is covered with a piece of thin paper, kept in position by a brass cap or collar. The cleanser is then screwed into the socket on the service-pipe, a percussion-cap placed on the nipple, which projects from the opposite end, and when exploded by a slight tap from a hammer, the powder is fired, and the obstruction driven out. The mode of application is shown above.

(*To be continued.*)

DEEP BORING FOR COAL.—At the meeting of the Institution of Civil Engineers on Tuesday, the 24th ult., Mr. G. R. Stephenson, President, in the chair, the first paper read was "On a Deep Boring for Coal at Scarle, Lincolnshire," by Professor Edward Hull, F.R.S. This boring was commenced about four years ago by a local company, to test the presence of coal in the neighbourhood of Lincoln—Mr. J. T. Boot, of Mansfield, being the engineer—and had been carried out by the Diamond Rock Boring Company. The total depth attained was 2030 feet; but as this depth was insufficient for the object in view, it was desirable that the bore-hole should be carried further down. The following formations, with their approximate thicknesses, had been passed through:—

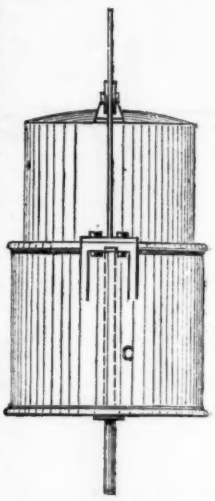
	Depths. Feet.	Thickness. Feet.
Alluvial strata	1 to 10	10
Lower lias clay and limestone	10 „ 75	65
Rhœtic beds	75 „ 141	66
New red marl and sandstone	141 „ 1500	1359
Permian beds	1500 „ 1900	400
Carboniferous strata	1900 „ 2030	130

Although the carboniferous strata had been reached, the cores brought up were of so peculiar a character as to leave it uncertain to what portion of the carboniferous formation they belonged; and, as the question of the eastward extension of the Yorkshire coal-field was one on which a boring at this spot was calculated to throw much light, it was important, both in an economic and in a scientific point of view, that it should be continued, until something definite had been determined.

FOULIS'S IMPROVED GAS-GOVERNOR.

Annexed is an engraving of a gas-governor recently patented by Mr. Foulis, M.I.C.E., Engineer of the Glasgow Corporation Gas-Works, the peculiar feature of which is that the outer bell or holder is dispensed with, the only moving part being the cone or valve.

The advantages of this are, that the size of the governor is very much reduced, the outer cone being smaller than an ordinary water-trap for the same size of pipe; the cost of construction is reduced to one-fourth, and, from the fewness and lightness of the moving parts, and consequent reduction of friction, the governor is exceedingly sensitive in its action.



The construction will be readily understood from the drawing. The outer case, A A, is of cast iron, closed at both top and bottom, and having a valve-seat, D D, cast in; C is the outlet, and B the inlet pipe. The cone or valve, E, is formed of two inverted cones, having a cylindrical prolongation, with the necessary float. The object of making the cone double is to neutralize the effect of the inlet pressure; or, in other words, to prevent the inlet pressure from having any influence on the action of the governor. In order further to attain this object, the triangular space formed by the two cones is enclosed by a continuation of the cylindrical portion of the valve. In this, slits are cut of sufficient area, and so adjusted that when the valve is full open the area of the portion of the slits below the valve-seat is rather greater than that above it, thus establishing an uniform pressure in the triangular space, and so equalizing the pressure on the two conical surfaces.

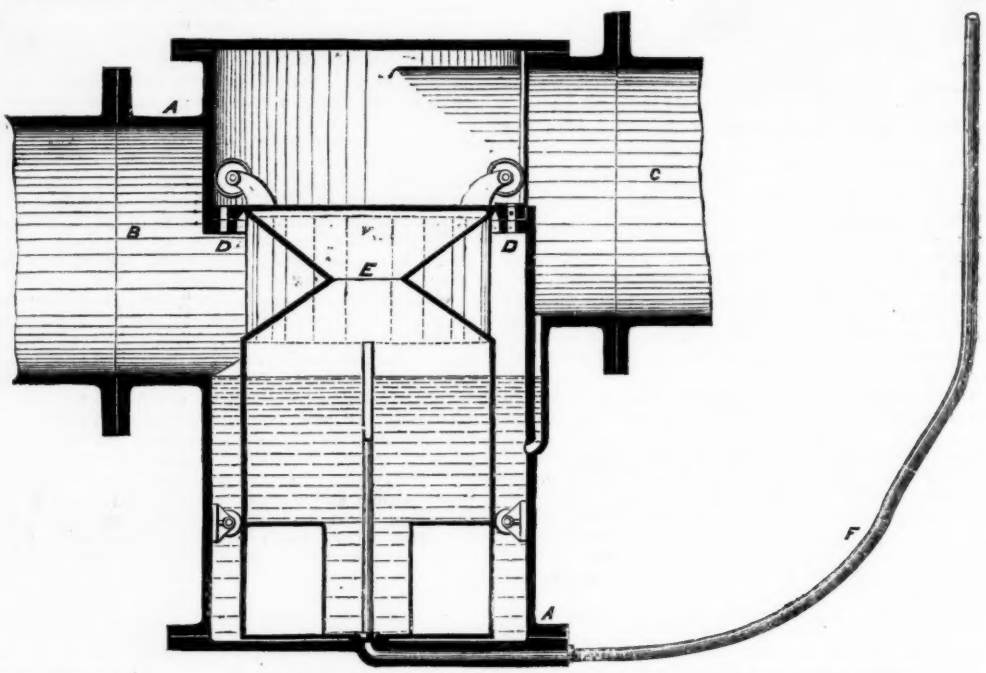
A small pipe, F, is led in at the bottom of the outer case into the interior of the valve. The valve is guided by three pulleys fixed on its top, and three pulleys fixed to the outer case at some distance from the bottom. By this arrangement the valve may be withdrawn on removal of the top cover.

The action of the governor is as follows:—Suppose that the weight of the valve is just balanced by the float, the valve will then be entirely under the influence of (*a*) the pressure in the small pipe, acting on the interior of the top, and (*b*) the outlet pressure acting on the exterior top. These two pressures must balance each other. Consequently, by altering the pressure in the pipe, F, the pressure in the outlet will be altered to a similar extent. The pipe, F, may be carried to any distance, and the pressure regulated by any means.

The method adopted of regulating the pressure in the governors already made, is to lead the pipe into a small vessel or holder, G, capable of being weighted at pleasure. This vessel and the interior of the valve are filled with air in preference to gas.

By loading the vessel to any pressure, a corresponding pressure will be maintained on the outlet of the governor, under varying conditions of inlet-pressure and outlet consumption.

The governor may be placed anywhere underground in the line of pipe, like an ordinary water-trap, the regulating vessel being placed at any distance in a room or office; or for street purposes it may be placed in a small chamber formed at the foot of a lamp-post.



Two of these governors (one 6-inch and one 18-inch) are now in constant use, giving most satisfactory results.

PARIS GAS COMPANY.

In another part of this JOURNAL we publish our translation of the report and statement of accounts of the Paris Gas Company, which will not be without features of interest to some of our readers.

Though given in great detail, the accounts do not furnish that reliable index to the interior working of the company which we are accustomed to in matters relating to our own metropolitan undertakings. For instance, all information as to the quantity of coal used and the gas produced and sold per ton is omitted, and, consequently, comparison on these essential points is prevented. Notwithstanding this, there are many items in the accounts which are not unworthy of comment, and to these we shall briefly refer.

Taking the capital account first, it is stated that the amount expended under this head to Dec. 31, 1875, was £6,120,451, to which must be added the amount expended on purchase of land and buildings, and in extension of works during the year 1876—viz., £360,524, bringing the total capital expenditure on Dec. 31, 1876, to £6,480,975, or 19s. 4⅜d. per 1000 cubic feet of gas produced; £3,360,000 of this is share, and the rest loan capital.

The quantity of gas produced last year was 189,209,789 cubic mètres (about 6,679,105,000 cubic feet), being rather more than 7 per cent. in excess of the preceding year, an exceptionally mild winter preventing a still larger increase.

The receipts for gas figure in the accounts for the very respectable sum of £1,851,365, and this amount seems exceedingly high; but the price of gas in Paris, consequent upon the terms of the company's concession, sufficiently explains it.

The share of profits accruing to the city this year amounts to no less than £332,000, and the consumers are taxed to this amount for the benefit of the whole community. But since it prevents those ever-recurring conflicts between the Municipality and the company, to which we are so accustomed on this side the Channel, the investment is not perhaps such a bad one for the company as might at first sight appear, especially as they are saved all the expenses incidental to referees and sulphur questions, to say nothing of anxiety and trouble inseparable therefrom.

It is rather surprising to learn that the cost of production has increased during the past year, our experience at home being generally in a contrary direction; but the report states that part of this increased cost is due to a rise in the price of labour, and part to old coal contracts, some of which are still unexpired.

In spite of the mild winter, only a slight falling off in the revenue from gas coke, as distinguished from oven coke, is noticeable. The policy of the company, in making and selling, at cost price, heating apparatus specially constructed to burn coke, is much to be commended; 43,032 of these apparatus have been turned out from the company's workshops, and must have materially assisted them in disposing of what is, at the present moment, a comparative drug in this country. No effort in this direction seems to have been attempted here, but, if the present state of trade continues—and the most sanguine see few signs of improvement—some fresh markets will have to be found for this residual.

Tar and liquor in France, as at home, have become an important source of revenue, and in the case of the Paris Company, who work

their own, produced £140,000* in 1876, as against £134,000 in 1875. The interests of the officers and servants of the company have not been neglected, as will be seen by a reference to the accounts of the Sick and Pension Funds; but space will not permit more than a passing reference to them here.

Briefly summarized, the revenue of the company for the past year amounted to £2,739,516, and the expenses to £1,597,213, leaving a balance of profit on the year's working of £1,142,303, which, with a balance brought forward, is raised to £1,160,000. Of this amount £496,000 is reserved for dividend on the share capital, according to the terms of the concession, before the city participate in the profits; the balance, after this deduction is made, has to be shared equally between the city and the shareholders of the company, each taking, in the present instance, £332,000—no mean contribution to the magnificent revenues of the City of Paris.

The dividend for the past year, even after payment of this very substantial sum, is the largest the company have ever been able to declare—viz., 62 frs., being 2 frs. more than last year—and speaks well for all concerned in earning it, whatever differences of opinion there may be as to the policy of dividing so large a sum.

Correspondence.

[*We do not hold ourselves responsible for the opinions expressed by Correspondents.*]

MR. VERNON HARCOURT ON SULPHUR PURIFICATION.

Sir,—If some statements which have recently appeared in your columns are really true, I must cease from the vain attempt to acquire knowledge and experience.

During the last seven years I have been constantly at work at some practical problem or other in gas manufacture. I have visited a score of gas-works, and in some I have spent weeks or months of almost constant attendance. I have held inquiries into the management of provincial gas-works, have arbitrated on the price of gas for public lighting, and have reported upon the arrangements to be adopted in introducing the average meter system. And, after all, Mr. Phillips writes that I have not, nor has either of my colleagues, that "practical knowledge and experience in the manufacture and supply of gas," which a Gas Referee ought to have, and which have been attained by his directors.

Still I might hope that, in "laboratory experiments," 20 years of constant practice had made me fairly proficient. But this hope also is denied me by the contemptuous criticisms of Mr. Patterson, which you published in your last number.

The apparatus and experiments on which Mr. Patterson comments are described in recent numbers of your Journal (pp. 503, 504, and 595), to which I must ask any of your readers who are interested in the matter to refer, since I cannot recognize in Mr. Patterson's account either my experiments or my conclusions. The particular error which has filled Mr. Patterson with astonishment is, that I have applied the solutions in question to the current of gas in an apparatus of which I give the following description:—

"I have set up here partly in illustration [of the modes of washing ammonia out of gas], partly because I venture to think the particular form a good one for the purpose, a small washer which I have made out of a piece of glass tubing. An obtuse double bend has been made in the tube at intervals of four inches, so that it consists of several portions which are parallel, and are now placed horizontally, connected by shorter portions which are inclined. . . . . The gas does not bubble through the water, but only passes over its surface, and perhaps, therefore, the apparatus does not so much resemble a washer as a Coffey's still, with its shelves spread out horizontally."

Here was the error. "Let Mr. Harcourt pass the gas *through* these two liquid alkaline sulphides, and then he will find that they *do* absorb the 'sulphur,' and that most efficiently."

What apparatus did Mr. Patterson himself employ—a washer in which the gas bubbled through the liquid, or a scrubber which, as Mr. Patterson says in his letter, "is constructed precisely on this principle of passing the gas, not through water, but over an extensive watery surface"? Here is his answer:

"I used these solutions in a small tin scrubber, about four feet high, filled sometimes with coke and sometimes with pumice, through which the gas, as supplied to the public, was passed, after being freed from its CO_2."

As I have stated in the lecture from which I have quoted, I do not think it makes much difference whether the gas passes through the washing liquid or close over its surface. The important factors are extent of surface and rate of transmission; but it was a relief to find that Mr. Patterson, who is so keenly alive to the absurdity of attempting to remove bisulphide of carbon "by merely passing the gas *over the surface* of the purifying material," should himself "have conducted such experiments in such a manner."

The difference which is really astonishing is the difference in our results. The matter is of some importance at the present time. My experiments were made in the hope of finding some liquid which might be available as a substitute for sulphide of calcium. I tried those which had been recommended, and others which suggested themselves to me as worth a trial, and I was disappointed that my results were negative. If Mr. Patterson is willing to furnish me with an exact description of the manner in which his experiments were made, I will gladly repeat them, and, with your leave, communicate the results to your readers.

Mr. Patterson asks, "Would any gas engineer (or, one would have thought, any chemist) ever dream of purifying gas from H_2S by merely passing it *over the surface* of oxide of iron, or of extracting the CO_2 by passing the gas *over the surface* of lime?"

I must confess to the belief that both of these are perfectly practicable; and I hope that some gas manager who is troubled with the pressure thrown by his purifiers will try the experiment. I showed at the Society of Arts the almost complete removal of sulphuretted hydrogen on passing foul gas over the surface of ammonia in the little apparatus I have described.

Since reading Mr. Patterson's letter, I have made the experiment he suggests of substituting for a solution of the alkaline sulphides an equal bulk, similarly disposed, of solid sulphide of calcium. A thin layer of this substance was spread along the bottom of the tube described above, leaving the upper half of the tubet, hroughout its length, clear for the passage of gas, which was sent through at the same rate as in my previous experiments with the liquid reagents. Instead of the sulphide of calcium having no effect when the gas passed over it, the amount of sulphur was reduced from 32 to 13 grains in 100 cubic feet of gas.

In the lecture on which Mr. Patterson comments, I stated: "If coal gas or hydrogen, which has been charged with bisulphide of carbon, passes through a not excessive quantity of sulphide of calcium, the bisulphide of carbon is wholly removed." This I believe to be true; but coal gas thus purified still contains sulphur in other forms, amounting to not less than 7 or 8 grains in 100 cubic feet. Contact with heated surfaces also destroys the bisulphide of carbon in gas, but leaves the other sulphur compounds unaffected. Porous substances, such as charcoal, are the only agents which I have found capable of completely purifying gas from sulphur; and these impair the illuminating power. Analyses may err as well as purifying processes be imperfect. I doubt whether the amount of sulphur in ordinary coal gas can be reduced, by the most liberal and careful application of sulphide of calcium, below about 7 grains in 100 cubic feet. Accordingly, I cannot admit Mr. Patterson's account of my conclusion: "Mr. Harcourt, in his lecture, states that he believes the 'sulphur' can be *wholly* extracted by sulphide of calcium."

One other statement I must correct in justice to my colleagues. "No less than £3000 has been spent by the present Referees in experiments to discover some other means of extracting the sulphur." The experiment upon the effect of heating gas, which is stated to have cost the above-named sum, was made by Dr. Siemens and myself. My colleagues have no responsibility in the matter.

Having referred to this experiment, I wish to explain one or two points in answer to Mr. Phillips's recent description of it, which I think unfair. The actual cost of the experiment was £1030, without deducting the value of pipes, valves, purifying-boxes, and iron plates, which remained when the apparatus was dismantled. The remaining £2000, with which the experiment is debited, is the estimated difference between the cost of making gas for about four months at Horseferry Road, and the cost of making it at Beckton. I know of no reason why the experiment should have been made at Horseferry Road rather than at Beckton, or any other place where gas-making is not suspended in the summer. I was unaware of this main item of expenditure till after the conclusion of the experiment, and I disclaim all responsibility for it.

The superintendent of the works, in a final report to his directors, dated June 24, 1875, states:

"The experiments commenced on Aug. 5, 1874, and were continued intermittently until the 26th of October. They began again on the 15th of March of this year, and have gone on with some variation up to the present time. The actual time the heater was under fire was 48 days in 1874, and 68 days in 1875, making a total of 116 days."

Why does Mr. Phillips now state that the experiment "lasted during a period of nearly 18 months"?

The experimental apparatus was not set up where it could be permanently used for the purification of gas, and the only result aimed at was knowledge—first, as to the practicability of reducing the amount of sulphur in gas by heating it, without affecting its illuminating power; and, secondly, as to the best mode of doing this. The first point was completely established, and much light was thrown upon the second. The actual working of the apparatus was, in some respects, unsatisfactory; but I believe that its defects could be avoided in constructing a similar apparatus for permanent use. Whether any reduction of sulphur, beyond the removal of sulphuretted hydrogen, shall for the future be required, is now *sub judice*. If it is required, I see no reason to doubt that the heating process might be used successfully, and is capable of accomplishing as complete a purification of gas as can be effected by lime, continuously, and without any risk of nuisance.

Oxford, April 28, 1877. A. Vernon Harcourt.

QUANTITY OF BRICKWORK IN RETORT-SETTINGS.

"Dans une controverse les invectives ne provent rien, sinon le manque de savoir-vivre de celui qui les emploie."

Sir,—In the Journal of the 6th of February last, Mr. E. S. Cathels puts forth a demonstration of the correctness of his "magazine-of-heat theory," which may be, in *his* opinion, "the highest degree of evidence;" but he will permit me, I hope, not to share this opinion, and to doubt whether the examples he alleges in support of the "reservoir-of-heat theory" are relevant to the subject.

1. I never objected to chequered walls, but only to the opinion that they should serve any other end than to support the retorts.

2. If the objection to the accumulation of a medium between the shell of the boiler and the contained water were only a question of danger in burning the plates over the furnace, and not also a question of fuel (as Mr. Cathels opines), one might cover the outer side of the boiler-plates with fire-bricks, whereby the boiler would be more durable, and the danger of burning the plates would be avoided. But does Mr. Cathels believe that, by doing so, the fuel account would be equal or even less than if the boiler were not covered? I am sure that it would be larger.

3. It may be that filling-up blocks have a beneficial effect in steam-boilers; but as these blocks are placed *in* the boiler, clear from the bottom and sides, and as the chequered walls in retort-ovens are put on the outer side of the retort, thus producing a medium between the heat of the furnace and the coals within the retort, the reference to the rudimentary "Treatise on Steam-Boilers" is irrelevant to the subject.

4. The kakelung argument is, in my opinion, rather a proof *against* the "magazine-of-heat theory." Mr. Cathels says that only two hours after the fire is made the kakelung begins to get warm on the outside. That is a proof that the conducting property of the material is very small.

* This amount does not include the sum of £12,240 for ammoniacal liquor, sold as such, and not converted into salts.

When, by some reason, a part of the material was suddenly cooled (as happens with the retorts by a new charge), it will last a long time before the outside will be hot again. That there will not be much difference in the temperature of the stove or the room ten hours after, is a proof that the kakelung has delivered but little heat to the surrounding air. Now, for a room, you may content yourself with a temperate, and at all times equal, heat (though it must be very inconvenient on a winter morning to wait two hours before you can warm yourself); but in a retort-furnace you want most heat directly after a new charge, when the inner part of the retort has been cooled by the same. The sooner the heat in the inner part of the retort is restored the better, and you cannot wait two hours as for the heat of the kakelung. Moreover, the closing of the flue after the wood has burned up is a reason why the kakelung argument is irrelevant to the subject.

5. I agree with Mr. Cathels as to the inequality of the duties which the furnace has to perform during the time the charge is "burning off," but I deny that the transverse walls act as compensating arrangements, and can retain the surplus heat when there is an excess, and restore it when there is a deficiency. With continuous firing, the heat in the interior of the retorts will always be lowest at the beginning of the process of distillation, when there is most need for it—the retort being cooled by the fresh charge—and highest at the end of the process, when there is the less need for it. How the "magazine-of-heat" defenders will prevent this I do not understand; and if they *could* prevent it they *should* not, as to the high temperature at the end of the process, for then they would have insufficient heat for the fresh charge, which requires the highest temperature.

Mr. Thomas Newbigging, in the JOURNAL of the 20th of February, doubts whether a retort of thin platinum would give good results. As to that I agree with him. The great expense is not the only reason to dissuade one from the experiment, the action of the ashes on the platinum forming silicium platinum, which would render the retorts very friable; but, theoretically, the material which best conducts heat would be most suitable for distillation. That iron retorts have given no saving of fuel has another reason than Mr. Newbigging will make us believe. The best temperature at which the distillation of coal proceeds being the cherry red, the temperature of the retort must be much above the cherry red in order to expose the mass of the coal in the retort to the required heat. This high temperature cannot be attained with iron retorts, because they would not resist, as fire-clay retorts do. Therefore, the process of distillation with iron retorts lasts longer, and less gas is produced. The greater duration of the process of distillation, because of the low temperature in iron retorts, is the reason why the use of these retorts gives no saving of fuel, as the conductibility of the material would lead us to expect. Notwithstanding iron retorts may be and are employed, where by some reason the heat produced for distillation cannot exceed a certain degree, which would be insufficient for clay retorts; as in Lowe's and Croll's arrangement of retort-settings, and in retort-settings which are heated with the gases of melt-kilns.

Such settings are a proof that a good conductor of heat traduces the heat more readily to the inner part of the retort, and that, but for the question of durability and fusibility of the material at the required and most advantageous heat for distillation, iron would be a better material than fire-clay.

The motto of this letter is addressed to Mr. Cathels, who surprised me by the invectives he accumulated against foreigners in the JOURNAL of the 27th of February, though I fear that the sense of this motto will be as hazy to his understanding as the wisdom of the proverb so frequently laid under contribution by him in his letter seems still to be; otherwise he would have apprehended what a bad compliment he pays to the Americans, and particularly to his friends, by the manner in which he writes. With regard to the proverb he quotes, I may remark that Mr. Cathels judges of the good manners of a man by the way he dresses. Now it may be Mr. Cathels's own manners, from this point of view, are irreproachable, but, having no photograph of that gentleman's pantaloons and hats, I have no proof that he has any good manners at all.

I am one of the foreigners who are so shamefully nicknamed by Mr. Cathels, and I am proud to declare that I do not apply to the tailor or the cook for good manners, as Mr. Cathels does. The mode in which Mr. Cathels makes his appearance as a champion for good manners is quite as ridiculous as that by which Russia takes the defence of humanity in Turkey.

As there are in this letter some communications personally directed to Mr. Cathels, I do not sign it, as my previous ones, with the initials of my name only, but fully.

Rotterdam, April 18, 1877. C. T. SALOMONS.

SUGGESTED EXHIBITION OF GAS APPARATUS AT BRISTOL.

SIR,—The exhibition of gas apparatus at South Shields was certainly a step in the right direction, and to the promoters of it is due the credit of having originated a movement which must lead to the more extensive application of gas to the necessities of every-day life. I cannot help expressing regret that, owing to the distance and time of year, many like the writer were unable to avail themselves of the advantage of personal inspection of the interesting display. That such an opportunity may not be altogether lost, I venture to make a suggestion. As you are aware, the meeting of the British Association of Gas Managers will be held this year in Bristol. Why not the occasion be availed of, and let us have an exhibition for the West of England, the same as the South Shields one was for the North of England. Believe me, it would in no small way contribute to the importance of the meeting, and it would afford a means to the members of making some valuable notes.

I am certain that the highly respected engineer of the Bristol Gas Company, Mr. Fiddes, would give it his hearty support, and the Colston Hall is not second to any in the kingdom for such a display. T.

UCKFIELD GAS COMPANY.—The report of the directors for the past year recommends that a dividend at the rate of 8 per cent. on the £2000 capital, amounting to £160, be declared, leaving a surplus of £49 5s. 7½d. to be carried forward towards the further reduction of the debenture debt at the earliest opportunity.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, APRIL 23, 1877.

The Middlesbrough Corporation, the Rotherham Corporation, and the Warrington Corporation Gas Bills were read a second time and committed.

The Falmouth Water and the London Corporation Bills were read the third time and passed.

TUESDAY, APRIL 24.

The Falmouth Water and the London Corporation Bills received the Royal Assent.

The Chairman of Committees informed the House that the opposition to the East Worcestershire Water Bill was withdrawn.

The Dundee Gas Bill was read a second time and committed.

The Londonderry Gas Bill was referred to a Select Committee, consisting of Lord Monteagle (chairman), Earl Manvers, Lord Delamere, Lord St. Leonards, and Lord Kenry; to meet on Friday, April 27.

THURSDAY, APRIL 26.

The Select Committee on the Londonderry Gas Bill was altered by the appointment of Lord Sherborne in place of Lord St. Leonards.

FRIDAY, APRIL 27.

The Examiners reported that the further Standing Orders applicable to the Longton Corporation Bill have been complied with.

The Kent Water and Stamford Water Bills, brought from the Commons, were read the first time, and referred to the Examiners.

HOUSE OF COMMONS.

MONDAY, APRIL 23, 1877.

The Kent Water and the Stamford Water Bills, as amended, were considered.

A petition in favour of the new Standing Order, "Gas Companies Additional Capital," was presented from Hastings.

The petition of John Giffard Riddell against the Newcastle and Gateshead Water Bill was withdrawn.

TUESDAY, APRIL 24.

The Blackburn Borough Gas, Water, and Extension Bill (Lords) was read the first time, and referred to the Examiners.

The following Bills were reported:—Perth Water; Alliance and Dublin Consumers Gas (Bray Supply); Carnforth District Water; Glasgow Corporation Water.

The petitions were withdrawn of the Great Western Railway Company against the Bridgwater (Corporation) Water Bill; of the Midland Railway Company against the Bristol District Water Bill; of the Hyde Gas Company against the Dukinfield and Denton Local Boards of Health Bill; and of the London and South-Western Railway Company against the Sunningdale District Water Bill.

WEDNESDAY, APRIL 25.

On the motion of Mr. ASSHETON, it was ordered—"That the Ramsgate Local Board Bill be recommitted to the former committee."

The Louth Gas and Coatbridge Gas Bills were reported.

The petition of the Staines, Wokingham, and Woking Railway Company against the Sunningdale District Water Bill was withdrawn.

STRETFORD GAS BILL.

Mr. RAIKES reported from the committee on the Stretford Gas Bill—"That the Bill empowers the company to enlarge and extend their gas-works, and to authorize them to raise £61,000 additional capital. The committee have divided the proposed additional capital into two parts, one of £11,000, or A shares of £10 each, the other of £50,000 B shares, also of £10 each. They have authorized the issue of the A shares of the company without restriction, in consideration of the smallness of the dividend which was authorized by the former Act to be paid on the larger portion of the original shares of the company. The B shares are to be sold by auction or tender in pursuance of the Standing Orders of the House, and they have inserted clauses in the Bill to that effect."

He further reported from the committee—"That they had examined the allegations of the Bill, and found the same to be true, and had gone through the Bill, and had made amendments thereunto."

THURSDAY, APRIL 26.

The Kent Water and Stamford Water Bills were read the third time and passed.

The Ashton-under-Lyne Gas Bill was reported.

Petitions were presented in favour of the Hanley Corporation Gas Bill from Inhabitants and consumers of gas in Hanley; and in favour of the Newcastle-under-Lyme Borough Extension and Improvement Bill from (1) Trustees of Newcastle-under-Lyme Burgesses Lands, (2) Owners, &c., in Newcastle-under-Lyme, (3) Owners, &c., and ratepayers within the district proposed to be added to the borough of Newcastle-under-Lyme.

FRIDAY, APRIL 27.

The Tudhoe and Sunderland Bridge Gas Bill, as amended, was considered.

On the motion of Sir CHARLES FORSTER, it was ordered that the minutes of the evidence taken before the committee on the British Gas Company (Norwich Station) Bill, in Session 1875, be referred to the committee on the Hanley Corporation Gas Bill.

The following Bills were reported:—Ashton-under-Lyne Improvement; Newcastle and Gateshead Water; Newport (Monmouthshire) Gas; North Cheshire Water.

A petition against alteration in the Blackburn Borough Gas, Water, and Extension Bill (Lords) was presented from Owners, &c., of property in Livesey.

HOUSE OF COMMONS COMMITTEE.

FRIDAY, MARCH 23.

(*Before Mr.* ASSHETON, *Chairman; Messrs.* SMITH, BELL, *and* DUNDAS; *Mr.* BONHAM-CARTER, *Referee.*)

RAMSGATE LOCAL BOARD BILL.

(*Continued from page* 630.)

Mr. *W. A. Valon*, examined by Mr. MICHAEL.

I have been manager of the Ramsgate Gas-Works for seven years, and before that time was engaged at the London Gas Company and Commercial Gas Company's works for about 16 years. The minimum day pressure of gas at Ramsgate is 10-10ths, and the maximum pressure 20-10ths. We set the governor at the day pressure (10-10ths) at midnight, and then it is not touched again until an hour and a quarter before sunset the next day, when it is raised to 13-10ths. Three quarters of an hour after that it is raised to 16-10ths, and a quarter of an hour before sunset

to 20-10ths. The pressure is continued till the shops begin to close, at about eight o'clock at night, and then it is reduced to 17-10ths; at nine o'clock to 15-10ths; at ten o'clock to 13-10ths; at eleven o'clock to 11-10ths; and at twelve o'clock to 10-10ths. The pressure is taken every week at various parts of the town to ascertain that the mains are clear, and that there is no stoppage. [Witness produced the book in which they registered the pressures.] The works are midway between the levels of the town, and we are obliged to bring the gas down to the lowest point by a trunk main before commencing to distribute it. We use Newcastle coal, and the illuminating power is kept as nearly to a standard of 14 candles as possible. It is tested every day with a Bunsen photometer, but we have also a jet photometer, which enables us to see inferentially the state of the gas during manufacture. We keep a constant tell-tale, by which it can be seen whether any sulphuretted hydrogen is allowed to go into the gas after it has passed the purifier. A piece of moistened acetate of lead paper is kept under a glass globe, through which the gas passes, and the presence of sulphuretted hydrogen is at once detected. The ammoniacal liquor is sold, and at the request of the contractor we keep it up to the high standard of 16 ounces to the gallon, because of the great cost of carriage. We are obliged to scrub and wash the gas very much to get so high a standard. We strive to keep up a high standard, both for illuminating power and purity. About the 1st of last December there was a little sulphuretted hydrogen in the gas, but it was the result of an accident, and was remedied as soon as found out, and I do not think it has occurred since. I have constantly kept up the illuminating power to 14 candles or thereabouts, and, as far as possible, kept it clear of free ammonia. As a matter of experiment, I have used tests for the purpose of ascertaining the presence of sulphur compounds, and have found them, on an average, to be from 30 to 32 grains in 100 cubic feet.

Cross-examined by Mr. BIDDER: We did not keep a book recording the pressures before Jan. 30, 1874, because up to that time we had been making considerable alterations in the street-mains, and took the pressure from time to time, to know what sized mains to lay down. It was at my suggestion that the new system of recording pressure was initiated in 1874. I do not recollect that it was about that time that the local board began to agitate the question of gas supply. The book recording the tests for sulphuretted hydrogen was commenced on April 24, 1876. That was after the proceedings in Parliament last year. The tests were taken quite as carefully before that date, but were not recorded in a book. The pressures shown in the pressure-book were taken at different points in the district. We have not lately had many complaints of want of pressure. The very fact that we have been improving our mains all over the town shows that there have been complaints from time to time, and that they have been attended to. I think it must be very nearly two years ago since we had anything like serious complaints. Those complaints came from Pegwell and St. Lawrence, and we have been carrying out works to remedy them. We did a great deal more in 1871, 1872, and 1873, in the way of extension, than we have done during the last two years. The pressure recorded in the book may be taken as representing the pressure the customer gets.

Mr. BIDDER read an extract from the book, under the date of Oct. 15, 1875: "We have received from time to time great complaints from the end of the district at Pegwell Bay. I thought for some time the defect or deficiency was caused by bad fittings, or some obstruction in the supply-main; but I now find, on further examination, that the gas does not reach there, as the following pressures, taken last Friday, during full consumption, will show." Then follows a list of pressures, beginning with the Market Place, 16-10ths; Bromley Hill, 12-10ths; West Cliff Terrace, 10-10ths; Hillier's field, 8-10ths; at another place, 5-10ths; and at Pegwell, 3-10ths.

Witness said that the mains at Pegwell and St. Lawrence were then very weak, but they had been remedied since.

Mr. BIDDER questioned the witness with respect to a letter which was in the book upon the previous day, but was not there then. It was, he said, from Mr. Curling to witness, telling him to be careful and be upon his best behaviour on account of the agitation and application to Parliament by the local board.

Mr. MICHAEL said that the letter was private and confidential, and Mr. Bidder had no right to have read it.

Mr. BIDDER said it was in a book which was handed to him, and he denied that he had acted improperly in reading it. He would, if necessary, give evidence as to its contents.

Witness: I do not think Mr. Curling gave any reason, except that he said, "Let us be careful this year, as we are on our trial now."

[Witness was cross-examined at some length respecting certain entries in the book recording the illuminating power, from which it appeared that upon some occasions the illuminating power of the gas fell below 14 candles, and was once or twice as low as 12½ candles. In explanation he said it was impossible at all times to keep the gas up to one standard, but he always endeavoured to do so as far as possible.]

Mr. BIDDER read an extract from the manager's report-book, dated Jan. 1 1877, in which the witness called the attention of the board to the necessity of some immediate steps being taken to provide additional gasholder room for the next winter, and which stated that had the town been supplied with as much gas as it could have taken during the Christmas week, the supply would have given out on the Friday night. (To witness: What do you mean by the latter statement?

Witness: I mean that in Christmas week, as a rule, the consumers would always take a great deal more than they ought to take, if we would let them.

Mr. BIDDER: You acted as a prudent captain of a ship on a long voyage—you put the consumers on short commons?

Witness: No; I did not put them on short commons, but I gave what I thought was sufficient.

Mr. BIDDER: What is the process of putting a town on short rations? Do you diminish the pressure, or how?

Witness: When we are short of gas, we take the pressure off as soon as we find the gas is coming back upon us.

Mr. BIDDER: Then the people must go to bed, or light candles?

Witness: There is nothing of that sort; you are only saving the gas in your gasholder that you might otherwise get paid for. [Witness was further cross-examined with reference to various complaints recorded in the company's books as having been made by consumers, and which he explained had been remedied by laying down larger mains, &c.] With reference to the coke, we sell it in the town as far as we can. It is retailed at the works at 12s. per chaldron, but coal merchants are supplied at a discount of 2s. per chaldron, and if they take 25 chaldrons we sell it at 9s. per chaldron. The coke which is not sold in Ramsgate is got rid of by outside contracts. We are sending some now to Faversham and other places, at 7s. per chaldron, put upon the rail. The company have taken all the circumstances into consideration, and we cannot see that by reducing the price in Ramsgate, we should increase the sale.

Re-examined by Mr. MICHAEL: The company do not put down a 12-inch main merely to supply half-a-dozen customers. When a small main is not sufficient to meet the consumption, we take it up and lay down a larger one. The company are taking steps to have the increased storeage power by Christmas time this year.

By Mr. BONHAM-CARTER: The company have no control over the fittings; the service-pipe even is paid for by the consumer; but that practice is very exceptional.

By the COMMITTEE: The coals we use come from the Pelton Colliery. The company get a good price for their ammoniacal liquor, and, therefore, they try to keep it up to 16 ounces per gallon. By getting strong ammoniacal liquor it does not necessarily mean that the gas has been freed from ammonia. It might mean the reverse. We are very particular about getting all the sulphuretted hydrogen away from the gas. The amount of sulphur is kept as low as possible, but we can find no other means of doing it, except by the use of lime, which is a very expensive and nasty process.

Mr. *F. J. Bramwell*, examined by Mr. MICHAEL.

I know Ramsgate well, and have inspected the works of the two companies. I have seen the two stations of the water company—the working station and the stand-by station. Chalk water is, in my opinion, very desirable water, and it is the only source of supply at Ramsgate that I know of, or have ever heard suggested. The local board did not propose in their Bill any other source of supply. I think 18 gallons per head daily a fair quantity for the resident population, and 10 gallons per head for visitors. I reckon a resident population of 20,000, and a maximum of 13,600 visitors when the town is full, and that gives the quantity required as 490,000 gallons. I believe, however, that, if the water is on constant service, that quantity will not be required, because I do not believe the visitors will take their 10 gallons, nor do I believe the inhabitants will take their 18 gallons. In company with Mr. Easton, we drew up the regulations which are to be submitted to the Local Government Board for their approval. With regard to the complaints which have been made respecting the pressure, I can only say that it is impossible to build a service reservoir higher than Providence has been pleased to make land to build it upon, and the company's reservoir is built in a very excellent locality with respect to high land. If persons build houses in the immediate neighbourhood, the only means of supplying them is by mechanical means—viz., pumping against loaded valves, and that the company have done. I presume that the pressures are considered sufficient, because I find that the local board, by their Bill, do not propose to give any more than the ordinary pressure that can be supplied by gravitation from the company's works. The gross annual income of the company is about £5000, which is equal to 4s. per head of the population, while the income of the London companies comes to 6s. per head. The income of the Ramsgate Company is barely 5¾ per cent. upon the rateable value, while they are entitled to charge 7½ per cent. on the rateable value or upon the actual value, at their option. In carrying out the provisions of the Act, I think the company have exercised their powers most moderately. To prove that where a constant supply has been given the result has been a diminution of waste, I should like to refer to the case of Liverpool, where there has been a reduction of 6½ gallons per head of the population through changing from the intermittent supply to the constant. That has also been the case at Norwich and other places. I do not think the consumers interests have been injured through the company not applying to Parliament since 1835, and I arrive at that conclusion in the following manner:—The company have a capital of £15,000, and they have increased the works out of surrendered profits by £19,000, upon which no dividend has been paid. The average dividend upon the £15,000 has been very much below 10 per cent., and in the result, as I stated last year, there was a profit to the consumers of some £10,500. Mr. Stevenson has found out that I omitted to deduct the £1000 that was written up within the capital sum, and I agree with him that in strictness, although it was within the capital, it ought to be deducted; that, therefore, would bring the saving down to £9500. If this money had been divided amongst the shareholders in those bygone years, they would have had the simple interest upon the money—that would have been in their pockets—whereas it has remained in the pockets of the consumers. But there is also a very great prospective advantage to the consumers which I did not state last year, and that is, that if the company had obtained a 10 per cent. Act, incorporating the 1847 clauses, they would have had £34,000 chargeable with £3400 of dividend in perpetuity, whereas now all they seek is £15,000 at 10 per cent., making £1500, and £19,000 at 6 per cent. (and I am told they are not to get that), making £1140—together, £2640—or a saving in perpetuity, even if they get what they ask for, of £760 per annum to the consumers. With regard to the gas, I can testify to the excellent manner in which Margate is lighted, both as regards the town, the shops, and the private houses. I cannot speak of the lighting of Ramsgate, as I have been there but rarely at night. I have inspected both stations of the company, and they appear to be well laid out. The storeage at Ramsgate is a little limited, which puts the manager in rather an awkward position just about Christmas time, but the necessary steps are being taken to put up a new gasholder. The Bill now before the committee proposes to make the capital of the company £72,000—£24,000 old capital, and £48,000 capitalized. With reference to the total quantity of gas produced, that capital is very low—it works out to about £600 per million feet—especially when it is taken into consideration that these works have been growing, and made piecemeal, and that they are so far away from the source of iron-producing industry. The gas company have also been conducted in such a way as to produce benefit rather than injury to the consumers, by a non-previous application for further powers. I explained last year that I thought they had benefited the consumers to the extent of £19,000. Mr. Stevenson has again hit the blot, that I did not deduct the amount that they wrote up within their authorized capital, and I think he is enabled to deduct that £8000, leaving £11,000, instead of £19,000. Again, I should say that there was the simple interest upon the money to be considered, and that has been in the pockets of the consumers instead of in the pockets of the company. As to the future, I have taken £24,000 at 10 per cent., and the £48,000 at 5 per cent., and that will work out to £4800 a year. Taking that upon the actual sale of 100 millions, will give 11¼d. per 1000 feet for profit. If these works had been made on parliamentary capital, bearing a mean dividend of 9 per cent., the amount of annual dividend would have been £6480, which would work out to about 16½d. per 1000 feet, as against 11¼d.; and therefore the difference between the two is the saving to the consumers in perpetuity. In my opinion, these profits are not certain to continue; I have for some time past been expressing a gloomy view of them. I believe the time is fast approaching when electrical light will be a strong and active opponent to gas. It is being used in France, and has also been put up at Crewe, and there is good reason to believe that with coals at 20s. a ton to work the engine and make the electrical light, and gas at 4s. per 1000, the electrical light can be obtained at from one-fourth to one-sixth the price of gas.

Cross-examined by Mr. BIDDER: If the gas shareholders only considered themselves, it would be better for them to realize the money invested as soon as possible; but not if they considered the public. If they are compelled to sell, I think they have a right to be treated as though they could keep up their works. My figures concerning the water supply per head at Ramsgate are based upon the assumption that the maximum number of visitors in summer is 13,600, which figures I obtained from Mr. Curling.

Mr. BIDDER: You compared the water income between this district and London, and showed it was less per head. In point of fact, the amount of water given in London per head is very much larger, is it not?

Witness: I think it is about 82 gallons per head, on the average. The Chelsea Company stand as high as 38·9, but there are some down to 26·8.

Mr. BIDDER: At Ramsgate there is the railway, the harbour, and the shipping in the harbour, and although Ramsgate is not a very large town, there is a certain quantity consumed for manufacturing purposes?

Witness: I should think the latter would be extremely small, nothing being manufactured there but beer and soda water, to my knowledge. I appreciate what you say about the railway and the shipping, but I am sure my estimate is ample. I am aware that Liverpool is a town in which the proportion of water-closets is comparatively small, and that would make a difference in the consumption of water, and on that account Ramsgate would require a larger supply than Liverpool; but that is compensated for by people washing in the sea at Ramsgate, and not wanting to clean themselves afterwards.

Mr. BIDDER: Assuming that the company had applied to Parliament in the ordinary way for the authorization of their additional capital, how do you make out that the consumers are £11,000 better off? You say the company ask Parliament to give 10 per cent. upon £24,000, and 5 per cent. upon £48,000, making a total of £4800 a year. Then you say that if they had applied to Parliament they would have obtained an average dividend of 9 per cent., which would have been equal to £6480, which is larger than the annual dividend they are now seeking to have authorized. Are you not making rather a large assumption in assuming Parliament would have allowed them 9 per cent. upon all their capital?

Witness: I do not think I am. I am assuming that the company would have probably come in the year 1850, when they began to feel the need of new capital, and when the rates allowed by Parliament were higher than they are in 1877.

Mr. BIDDER: In the present case, out of the £72,000 all but £16,000 is coming out of the pocket of the consumer himself, whereas had the company applied to Parliament, and raised the capital under the authority of Parliament, they themselves would have had that amount of capital. So that there is the broad difference, that in the one case the consumer himself has found, let us say, three-fourths of the capital, and in the other case the shareholders would have to find the whole?

Witness: There is that broad difference in words, but not in figures; because the consumers, if the shareholders had found the capital, would have been compelled to pay the statutory dividends upon it, and also the back dividends; whereas, the consumers finding the capital, no dividend has been paid upon it from that time to this. The whole question is, have the company had more or less out of the capital by that process than they would have had by getting the consumer to pay upon the statutory dividend? and the answer is that they have had £11,000 less.

The CHAIRMAN said the committee could make use of the figures as well as the witness.

Mr. MICHAEL said he had finished the evidence for the two companies.

Mr. WILLIAMS then addressed the committee on behalf of certain inhabitants of St. Lawrence who had petitioned against the Bill of the gas company, and in support of that of the local board. He said his clients were placed at an exceptional disadvantage by the companies, the supply of gas for the public lamps and private houses, and the water supply to houses and at fires, having been very inadequate. He alluded to the difficulty experienced in getting a supply of gas for St. Luke's church, and contended that the company had been wanting in consideration for the requirements of the parishioners of St. Lawrence. With reference to what had been stated about St. Lawrence being taxed for the benefit of Ramsgate, he (Mr. Williams) said his clients had very little objection to that. They were pretty dearly taxed at present for the benefit of Mr. Curling's shareholders, and they had no objection to being taxed for the benefit of their neighbours, especially as there was an exceptional provision in the Bill that one-half of the profit should actually come into their own pockets. Ramsgate and St. Lawrence were practically one town, their interests were identical, and whatever was important for the welfare of the one was important for the welfare of the other. He submitted that the time was very near—and had practically arrived already—when Ramsgate and St. Lawrence would be one, and in passing the Bill, although nominally passed on the request of the inhabitants of Ramsgate, the committee would pass a Bill in which the inhabitants of St. Lawrence had a very great interest, and by which an inestimable benefit would be conferred upon them.

Mr. POPE, in addressing the committee on behalf of the gas and water companies, said that the Ramsgate Local Board, by bringing forward their Bill, were attempting to reverse a decision arrived at by Parliament last year, after the whole case had been carefully considered. That decision was, he submitted, not only in conformity with sound principles of legislation, but with the uniform practice of Parliament, which had never sanctioned the principle that because a local board, with an eye to profit as much as to the public advantage, chose to come and bring all sorts of cock-and-bull stories two years consecutively before a committee, it was the duty or the right of Parliament to confiscate the property of others for the benefit of that local board. Before anybody could justify an application for special powers in their own favour, and, above all, before they could justify an application for the sacrifice of private rights and property in their favour by special legislation, they must satisfy Parliament that the general legislation was so unsatisfactory, or so unsuited to their case, that they were obliged to appeal to special legislation because the general powers were insufficient. In 1875, acting on the principle that ordinarily it would be better for public bodies to have charge of the lighting and water arrangements for the communities over which they presided, Parliament enacted certain provisions, stating what powers it would give to public authorities where there were any existing interests with which those public authorities might desire to contract, and if it were possible for Parliament to give, by legislation, an indication of what its mind was, it was that the remedy, even for misconduct on the part of the company, was not confiscation, but was to enable the local authority, by competition, to procure for themselves what the company did not choose, or were unable, to furnish. It would be admitted that if it were a contest between a new company applying for powers, and a local board coming for powers to supply themselves, the committee would in all probability prefer the local board to the public company, because there were undoubtedly general advantages in placing the sanitary matters in the hands of the local authorities; but where there were existing interests, Parliament had rightly defined what their respective duties and respective privileges were. The committee were now asked, without any of the circumstances being altered—excepting that everything was being done by the water company to carry out what had been pledged for them to do—to reverse the decision of the previous year, and to hand over the property to the local board of the district. The learned counsel then quoted various sections of the Public Health Act, 1875, providing that local boards might construct water-works, but, in the event of there being an existing company in the district, they must first prove that the company were not able and willing to give a proper supply, and asked what the Ramsgate Local Board had shown, except that they had been negligent of their duty, and had not endeavoured to put in force the powers they already had. They applied for powers to purchase works which they said were insufficient, improper, and inadequate for the purpose, but there was not a single suggestion or power in their Bill to enable them to make the works any better, and the only power they would have to carry out the improvements which they said ought to be carried out, was the power in the very Act which they had themselves refused to put in force. What was the duty of the local board, if there was an insufficient supply? According to the 62nd clause of the Public Health Act, if the surveyor of the local board reported that any house within their district was without a proper supply of water, and that such a supply of water could be furnished, the local authority could give the owner notice in writing, requiring him, within a specified time, to obtain such supply, and for that purpose he might enter into a contract with any water company supplying within the district. That gave the local authority absolute power to deal with the water supply. If the houses were insufficiently supplied, the owners could be called upon to supply them, and if they did not do so the local board could do it themselves. If the water company could not let them have the water, there was a provision that if an arbitrator said their demand was reasonable, and ought to be complied with, the local board could put in force the very powers which they said they were contemplating putting in force, for the purpose of obtaining it. It would have been impossible for Parliament to have devised more complete powers for the benefit of any local authority, not one of which had the Ramsgate Local Board thought fit to exercise, and they had, therefore, no title to ask for powers of compulsory purchase. The local board did not come forward and say, "Let us acquire the undertaking, and we will show you what additional works we are going to construct, so as to supplement the defects in the supply of Ramsgate," but the company did come forward, in conformity with their pledge of last year, and showed that they were prepared to do that which Parliament had suggested they should do. It was perfectly plain that Parliament was very careful to protect the interests of existing companies and the remedy it provided was competition on the part of the local authority, and not confiscation, even in the event of there being any misconduct proved. With regard to the proceedings of last year, it was quite true that the Bills were withdrawn, and the reason was, as he (Mr. Pope) told the committee at the time, that up to that period no case could be found in which Parliament had given compulsory powers to purchase a company, who were not before Parliament themselves, asking for privileges. The Bills were, therefore, withdrawn; but both of the companies distinctly stated that in the event of the confiscation Bill of the local board being rejected, they would pledge themselves to bring forward Bills to place themselves under parliamentary control as regarded quality and price, and which should give the local board an opportunity of discussing all the details. Accordingly, the chairman, in giving the decision, said: "We also reject the Ramsgate Local Board Bill, and we do it on the understanding that your pledge will be carried out, and that you will come with a Bill which shall enable Parliament to assume the control of you, and if there be any mischiefs to remedy they shall be remedied." That pledge was faithfully carried out, and the moment the companies left the commitee-room they took the necessary steps for that purpose. If, then, the companies applied for their Bills in conformity with their pledges, while the local board applied without any new case or any new evidence, which Bill should receive the preference of the committee? If there were any mischiefs to be remedied, they could be remedied under the Bills of the companies. Was it true that the gas was insufficient in pressure or illuminating power, or that there was a want of a constant supply of water? If so, the companies were there to carry out all those objects, and what possible case was there to justify the local board in seeking to seize the property of the companies against their will, because that was what they were seeking to do? What did the local board want as a sanitary authority? They allowed Mr. Stevenson and their other engineer to leave the chair without being asked a single question upon that subject. Was it to be supposed that if there had been any real grievance they would have been content with such evidence as that of the witness who said he saw the gas coming up out of a hole, or the other witness who said he judged of the illuminating power by putting a photometer in his shop-windows? The local board did not suggest that they were going to make better gas or supply better water. What security had the committee, if they handed the works over to the local board, that they would not just be content to keep those works going, and pocket the proceeds in reduction of the rates, not increasing the supply one atom, because there was nothing to compel them to do so. They had been negligent of their duties hitherto, and what possible security was there that they would be more diligent in the performance of them hereafter? There must be a large additional expenditure upon the works in order to obtain the supply which was said to be necessary, and what possible difference could it make if that expenditure was made by a company, regulated as regarded their profits and dividends, and which undertook to make it, or by the local board, which did not undertake to do so, and who were to pay, according to their own theory, the full value of the works they would be obliged to take over. The first thing to start with was that the local board must pay the full value of the undertaking, and if there was any prospective value, that also must be paid for; and if that were done, it would extinguish all the difference between the 4½ per cent. borrowing, and the 7 per cent. dividend. A very important question was, what guarantee was there that the local authority—which had been so negligent hitherto—would ever carry out any of the powers which the committee might vest in them? The argument of his learned friend was that the Act of 1875 was the only thing they could appeal to to extend their works, but they could not have it both ways—either they had no powers, or if they had, they had not exercised them. The Act of 1875 was the only thing they would have; but there was not a word in their Bill about increase of works or increase of powers in any way. He (Mr. Pope) did not propose to go through the whole of the complaints that had been made, but he would ask the committee whether, when there had been sufficiently responsible witnesses in the box, there had not been an unanimity of opinion, or, at all events, an absence of condemnation of the quality either of the gas or water. Their doctors did not complain of the water, except the gentleman who talked about nitrate of lime, which appeared to have the peculiar faculty of producing diarrhœa in the summer, if not in the winter. Without, however, going through the whole of the evidence, did it amount to anything more than the foolish and idle gossip which always existed in a place where there was an agitation to obtain possession of a profitable undertaking? It spoke very well for the companies that, under all the circumstances, there had been so few complaints. It was well known that there were complaints at times against every company, but the remedy for those complaints was not to place the property of the companies in the hands of the local boards, but to put in force the powers which Parliament had placed in the hands of the consumers, or of the local authorities, to keep companies in proper order. It had been stated that these companies had been a long time in applying to Parliament, and that they had spent a large amount of profit on the works, and that that represented some injury to the ratepayer or consumer who had paid his share of those profits. Supposing it were true, was that any ground for the local board confiscating the property of the companies? That matter was discussed last year, and it was part of the case upon which the committee decided that the companies were to place themselves under statutory powers during the present year, and they were there for that purpose. They did

not even ask for the capitalization of the whole of the amount expended out of profit; they proposed to make the ratepayers a present of £13,000, because they only proposed to count as capital £48,000, out of a capital of £61,000, which had been actually expended. What difference on earth could it make whether the money which had been judiciously expended in increasing the gas and water works came out of the profits or out of borrowed money, the interest upon which must have been paid out of dividend, or out of calls upon shares, or in any other way. If the company were dividing 10 per cent., and then putting into capital profits which they earned over 10 per cent., he (Mr. Pope) could have understood an objector saying, "You have divided what you are entitled to, and therefore it will be cheaper to borrow the surplus at 4 per cent. than to make it a capital bearing dividend at 10 per cent." But supposing the companies were entitled to divide 9, and only divided 5 per cent., and put the remaining 4 per cent. into capital, what possible difference could it make whether they paid that 4 per cent. to somebody from whom they borrowed it or to themselves? In conclusion, he would ask the committee to adhere to the decision of last year, because it was just in point of detail, and right in point of principle; and he would also ask them not to depart from the lines of legislation which last year were again and again sanctioned, by enabling the local board to acquire powers to which they had no title, without having shown any ground to justify such an application as they had made.

Sir E. Beckett, in replying upon the whole case, said that, so far from the decision of parliamentary committees being considered irreversible, it was well known that Bills had often been passed after they had been rejected not only once, but even four or five times. If it was intended that the decision of committees should be final, why had not Parliament made a Standing Order to prevent rejected Bills being reintroduced? But, so far from that being the case, care had always been taken, as far as possible, to avoid letting the same members sit a second time upon a committee on which they had sat once, in order that their actions might be unbiassed. With regard to the remarks that had been made respecting the Public Health Act, there was no doubt that that Act contained provisions which would be very valuable to the local board after they had obtained the gas and water undertakings, but those provisions were useless as a means for the acquirement of the works in the first place. The recommendation of the committee of last year, "that the gas and water companies should be brought under parliamentary control at the earliest opportunity," was made pretty early in the session, but it was not acted upon by the companies, who could, if they had been so disposed, have reintroduced the Bills they had withdrawn; but they preferred taking the chances of another year, because they thought the local board would be divided upon the matter, and that they would not be able to get up the steam for any further opposition. They discovered, however, that there was a large majority in the town against them, and, therefore, it was necessary to reintroduce their Bills in the present session, and that was an additional piece of misconduct. They ought to have offered the committee last year the same opportunity of regulating their powers, which they dared not withdraw from them now while the three Bills were before them. It had been stated, over and over again, that no fresh complaints had been made since the companies were before the committee last year. That was not true, but, even if it were, there would be a very good reason why, because they had seen a letter from the chairman to the manager, in which it said, "Remember we are on our trial." Luckily, however, there was evidence, and they had it from the best of all sources—viz., from the report of the manager himself to his directors on the 1st of last January, in which he stated that he had not power to give a proper supply, although they had been on their good behaviour. He (Sir E. Beckett) would not have cared if there had been nothing after last year, because his complaint was as to past misconduct. If, when a Bill was brought in against a company by a local board, the company were to be entitled to say, "We are beginning to do better, and we shall do better if you throw out this Bill," it is evident no body of men would introduce such Bills, because they would know it would be useless. For the last three or four years, even according to Mr. Curling's admission, there had been an increasing agitation in the town against these two companies, and yet they said, "These are the most ungrateful people that ever were; we have been spending a large amount for their benefit." People could generally see on which side their interest lay. There were ratepayers in Ramsgate as well as a water company and a gas company; and yet those ratepayers, having their eyes open to the tremendous benefit which had been conferred upon them, had been complaining of bad gas and insufficient water, and that the companies had been charging too much and dividing too much. His friend (Mr. Pope) said those complaints were merely idle gossip, such as he would undertake to get up against any gas or water company; but how could that be, when the committee remembered the kind of complaint made and not answered? They had had private people and hotel-keepers before them, who had said how bad the gas was; there was a meeting in 1874 about the high prices, and constant complaints had been made of the water supply being insufficient. What complaint could be made against a gas company or a water company that had not been made against these two companies? The duty of a gas company was to supply good gas at a low price, but had the Ramsgate Gas Company done that? Mr. Curling admitted that they had never tested it till within the last two or three years. Mr. Pope had said that Mr. Stevenson had not mentioned it, but the gas had been so bad that it was not a question of testing. It was only when they came to nice shades of division that testers were required to test the quality of the gas. With regard to the water company, he (Sir E. Beckett) would like to know what answer they had to make to the statements about the gross insufficiency of the water. They had tried a bold stroke about the matter. After witnesses of every description had said that they knew perfectly well that the population in summer was from 50,000 to 60,000, up came Mr. Curling, who said that "judging from the rate-book, I am sure there cannot have been that population." Was that worth attending to? Mr. Curling allowed no visitors for the cottages, although they, as well as the richer houses, were full; and upon that ridiculous contradiction of what the witnesses for the promoters unanimously said, the committee were asked to believe that the population was only two-thirds of what the local board put it at. If the committee should think that the water supply was not sufficient, what conceivable answer was there to the allegation that the water company had kept the town upon starvation allowance? Was that proper conduct, or in the slightest degree defensible? Mr. Curling had said they only wanted a steam-engine, but they had plenty of money to order it with. How had they spent their money hitherto? Mr. Curling wanted an Act of Parliament to give him a little money; but how did he get the £62,000? Was that by virtue of an Act of Parliament? A man who could get £62,000 without an Act could get a little more. Regarding the question of price, supposing the companies Bills were passed, with an obligation to sell all their future shares by auction, would they not be just as well off if the Bill of the local board were passed, because there would be an end to the shareholders getting the benefits of those sales? Railway shareholders were continually receiving papers asking for tenders for unissued shares in such and such companies, but gas companies had not yet arrived at that point of conscience. He (Sir E. Beckett) did not know whether, if the proposed Standing Order were passed, that conscience would be provided for them; but he asked the committee to provide it in the present case, and if that were done there would be an end put to their dividing anything more than the £2400 a year, which they could do at present. That £2400 a year the local board were perfectly willing to buy at an extreme price—either at the price which the market had determined, or at the price the committee might determine, or at an arbitration price; but, in consequence of the expense attending arbitrations, if the committee would settle the matter they would prove themselves to be public benefactors. It had been generally admitted that it would be better for the supply to be in the hands of the local board; even his friend (Mr. Pope) had said that if it were a new concern it would be far better for the population at large that the whole matter should be in the hands of the local authority. If it were to pass into their hands at all, what was the use of talking about confiscation when it was known that no committee or arbitrator ever dreamt of doing anything but giving a price which left the shareholders in a better position than they were before? Was not 4 per cent. guaranteed dividend on any decent concern, much more the rates of a town, equivalent to a precarious 5 per cent.? Supposing they had a guaranteed sum exactly equal to what they had been hitherto receiving as the maximum dividend, every share would rise 20 per cent. in value, for the reason that guaranteed shares were always worth at least 20 per cent. more than non-guaranteed ones. The learned counsel concluded by asking the committee to take care of the pecuniary interests of the companies in what they considered a fair way—not to give them more than a moderate amount, if any, of their past illegal profits, which had been capitalized—but to deal with the matter, on the whole, in such a way as would leave every shareholder with a fixed dividend equal to his present precarious one, or if they preferred it, to leave it to arbitration.

The room was then cleared. After deliberating for some time, the parties being called in,

The Chairman said the committee thought it very desirable that the parties should come to an agreement, and they would, therefore, reserve their final decision upon the preambles of the three Bills till the following Monday.

Monday, March 26.

Mr. Venables said that, in consequence of the intimation of the committee, a meeting had taken place between the parties on the previous Saturday, but without any result, the companies having declined to state any terms upon which they were prepared to sell their undertakings.

Mr. Michael said it was quite obvious that the companies, who were unwilling to sell, had no offer to make, but they asked Mr. Cooper whether he had anything to propose on behalf of the local board, and he said, "We have no offer to make other than that which has been already made." It was, therefore, perfectly useless to proceed, and the meeting broke up.

Mr. Venables said his clients were perfectly prepared to negotiate within any reasonable limits, and, having made their offer, they thought it the best plan to ask the companies for an offer.

Mr. Michael said that at the suggestion of the committee, the companies wrote a letter, stating that they would be very happy to meet the local board, of course expecting that when an offer had been made and refused, they would have something else to propose; but they had nothing, except the offer which had been before made, and which was seriously less than the amount mentioned at the commencement of the proceedings. It was, therefore, absolutely absurd to ask for an interview.

Mr. Venables said the local board were perfectly willing, as to the amount of terms, to abide by any decision at which the committee might arrive.

The committee-room was then cleared.

After a short time the counsel and parties were again called in, and

The Chairman said: The committee have decided that the preamble of the Bill of the Ramsgate Local Board is not proved; they have decided that the preamble of the Ramsgate Water Bill and the preamble of the Thanet Gas Bill are proved. The committee had it in their minds to make amendments in the clauses of both Bills, referring to additional capital and improvement stock; but they cannot go into the clauses until after Easter, in consequence of a direction which they have received from the Chairman of Ways and Means, requesting them to put off the consideration of the clauses of all Bills of this description until that time.

Mr. Bidder suggested that the committee should not report their decision until after Easter. He would also ask whether they would consider the propriety of passing the Local Board Bill, with a suspensory clause, the effect of which would be that, if the Bills of the companies were proceeded with and carried through, then the Local Board Bill would drop; as otherwise there was no guarantee that what happened last year might not happen again—viz., that the two Bills would be withdrawn, and matters left as heretofore.

Mr. Michael said that proposition was a deliberate request to the committee to reverse the decision at which they had already arrived. The two Bills were withdrawn last session previously to their coming before the committee, and therefore it was utterly impossible for them to repeat that proceeding.

Mr. Bidder contended that he was not requesting the committee to reverse their decision. His clients fully accepted the decision of the committee; but the clause simply provided for the event of those Bills not being carried through. His learned friend said it was impossible for the companies to repeat what they did last session. Why was it impossible? Who could make them go on with their Bills if they did not choose to do so? What was to prevent their withdrawing the Bills between the two Houses, or even after they had passed through the Committee of the House of Lords? Nobody could carry them forward to a third reading except themselves. If the companies meant to go on with their Bills, the clause would not do them the slightest harm.

The committee-room was again cleared.

On the parties being called in,

The Chairman said: The committee have decided not to insert the clause which has been submitted to them. At the same time they wish to state that they hope the parties will consider themselves held to the undertaking given by Mr. Michael, that they will *bonâ fide* proceed with their Bills through Parliament.

Mr. Michael: I say that, sir, as strongly as I am empowered to do in words.

Mr. Bidder: Whatever deductions in the capital are made? The committee have intimated that they intend to deal with the capital question after Easter, and they might deal with it in such a way that the companies would think it not worth while to go on with the Bills. I should like my learned friend to say that they are absolutely prepared to go on with their Bills.

The Chairman: We think that the present condition of affairs in Ramsgate is very unsatisfactory, and that it ought not to continue.

Mr. Michael: I have no *arrière pensée* in the matter, and I say that we shall proceed with our Bills immediately the committee are prepared to take them.

Mr. Bidder: I must ask for a more definite answer, because, if you look

at the gas Bill, you will see that the preamble is conditional upon the capital being as it is sketched.

Mr. BONHAM-CARTER said he thought an absolute undertaking should be given that, however the capital was dealt with, the companies would proceed with their Bills.

The CHAIRMAN: I think we cannot go any further than we have gone.

Mr. BIDDER said his learned friend had given no undertaking whatever.

Mr. MICHAEL: I say that we are prepared *bonâ fide* to proceed with the Bills as soon as the committee are ready to go on with them.

The CHAIRMAN: Do you speak for your clients?

Mr. MICHAEL: Certainly; whatever I say I bind my clients by.

Mr. BIDDER: But, if the decision of the committee as to capital is such as the companies do not like, are they prepared to go to the House of Lords?

Mr. BONHAM-CARTER: Not merely to proceed before this committee, but to promote the Bills through Parliament.

Mr. MICHAEL: The chairman did not ask me that. I have answered the question in the sense in which it was asked.

Mr. BIDDER said that if the committee did what his learned friend did not like, he would not proceed a step further, and his clients would be left in the same position.

Mr. MICHAEL: We have had two decisions of the committee, and now my learned friend asks for the third. It is the most irregular proceeding which I have ever heard of in my life, and I appeal to the chairman of the committee, and also to the referee, whether they have ever heard any discussion of this kind before.

Mr. BIDDER: My learned friend carefully guards his words. He undertakes to proceed with the Bills before this committee.

Mr. MICHAEL: The committee cannot pledge me to anything more.

The CHAIRMAN: Mr. Michael would not do anything so foolish as Mr. Bidder suggests. As regards any proceedings before this committee, so far as the preamble is concerned, they are at an end.

Mr. BIDDER: My learned friend will not give you the slightest undertaking that if you deal with the capital in a way which he does not like, he will go a step further with the Bills.

The CHAIRMAN: It appears to me that Mr. Michael has given the committee the undertaking as plainly as any one can in words.

Mr. BIDDER: At any rate, sir, will you allow me to ask you not to report your decision until after Easter? There is no harm in that, because it may be that during the vacation the parties will come to terms.

The CHAIRMAN: We shall report the Local Board Bill.

TUESDAY, APRIL 24.

At the sitting of the committee this morning,

Mr. BIDDER stated that during the recess the parties had been in negotiation, and he was happy to state that at the last moment terms had been arranged between the Ramsgate Local Board and the companies, under which the undertaking of the water company, and so much of the undertaking of the Isle of Thanet Gas Company as related to Ramsgate, would be transferred to the local board, at prices already agreed upon. He believed that this arrangement would meet the approval of the committee, and he would ask for a short adjournment of the proceedings before them to enable the parties to make the necessary alterations in the Bills to carry out the objects in view. He should also have to ask the assistance of the committee, as it would be necessary to move the House to revive the Bill of the local board. Probably, too, the committee themselves might desire to insert some clauses in the Bills, in compliance with the Standing Orders of the House.

Mr. CHANDOS LEIGH concurred in the application for a postponement, inasmuch as only the Ramsgate portion of the gas undertaking was to be transferred, and the Bill would have to be altered with reference to Margate. The committee had suggested that they also might have some amendments to make, and his clients would like to come prepared next time to carry out their views.

The room was then cleared, and, on the parties being re-admitted,

The CHAIRMAN said: The committee are very glad to hear that an arrangement has been come to, and they think it right to say that they will consider it their duty to insert auction clauses in both these Bills when they come before them. In accordance with the wish of counsel we shall adjourn till Tuesday next.

Mr. BIDDER: Perhaps you will kindly further the application for the recommittal of the local board Bill.

The CHAIRMAN: We will do anything we can in that way. We intimated the other day that we should somewhat cut down the Improvement Stock in both Bills.

Mr. MICHAEL: As I understand, you propose to insert auction clauses in the gas Bill?

The CHAIRMAN: Yes.

Mr. MICHAEL: It will be subject to an application on our part to have sliding scale clauses inserted.

The CHAIRMAN: Subject to your application; but we give no decision upon that point now.

Mr. MICHAEL: I only say we intend to bring up clauses to that effect. It will be necessary to give evidence of the desirability of those clauses, and also as to the initial price at which the sliding scale should commence.

The CHAIRMAN: Yes. We do not pledge ourselves to a sliding scale at present.

Mr. DURNFORD said, as representing Margate, he ought to state this. In the local board Bill there was power to purchase the whole undertaking of the Thanet Gas Company—the Margate as well as the Ramsgate portion—and there was a provision that the Ramsgate Local Board should be compelled to sell to the Margate Corporation the works which supplied that town. But if the Bill was now altered, and the local board were authorized only to purchase the Ramsgate undertaking, unless the gas company were compelled to put a similar clause into their Bill with reference to Margate, his clients would be left at the mercy of the company with all their debts.

Mr. MICHAEL said the Margate Corporation did not think fit to oppose the gas company's Bill as originally introduced, and he did not see how they could now obtain a *locus standi* to oppose merely because the Bill, as altered, would refer to a part, and not to the whole, undertaking.

Mr. DURNFORD said he was quite aware that as against the gas company's Bill his clients had no *locus standi*; but he thought they would have a right to be heard against the local board Bill under the changed position of affairs, and, unless the board consented to make his suggestion a part of the arrangement, he should object to the revival of their Bill.

The REFEREE (Mr. Bonham-Carter) said, if the Corporation of Margate had originally opposed, their right to do so would be revived by the recommittal of the Bill, and

Mr. BIDDER admitted that whatever rights the opponents had against the Bill before, they would still have.

Mr. MICHAEL said this was a matter which they must settle with the promoters of the local board Bill.

The proceedings were then adjourned until Tuesday, May 1.

Legal Intelligence.

HOUSE OF LORDS.—THURSDAY, APRIL 26.

PATTERSON *v.* THE GASLIGHT AND COKE COMPANY.

An appeal was presented by the plaintiff in this case, and the company were ordered to lodge cases in answer thereto.

HIGHGATE POLICE COURT.—MONDAY, APRIL 23.

ALLEGED EMBEZZLEMENT BY THE ASSISTANT SECRETARY OF THE COLNEY HATCH GAS COMPANY.

William Henry Wood, 28, late assistant secretary of the Colney Hatch Gas Company, was charged with embezzling various sums of money, amounting in all to £900, which he had received on account of the Colney Hatch Gas Company.

It appeared that the prisoner, in addition to being assistant secretary of the Colney Hatch Gas Company, for whom he had to receive the money from the collectors, and pay it into the London and Westminster Bank, also held a good position in the Brighton and Hove Gas Company's service. In September last an audit of the books of the first-named company showed that a considerable amount had been embezzled. The prisoner disappeared, and a warrant was issued for his apprehension, and placed in the hands of Detective Dalton, who found that he had sailed, under the name of Jackson, in the *May Queen*, with a young woman, whom he represented as his wife, for New Zealand, leaving behind him a wife and five young children. The detective also proceeded to New Zealand by steamship, and, upon the arrival of the *May Queen*, arrested Wood and brought him back to England. Wood handed over to the officer a draft for £450, some gold, a handsome gold watch, and a Colt's revolver. A letter from the prisoner to the chairman of the gas company was put in. In it he declared that "his greatest grief was that he was obliged to leave his wife and five little children to the tender mercies of the world," in addition to which he had "to part with a sorrowing mother." His defalcations he stated at £650, to repay which he had borrowed the money at a high rate of interest; but being, in consequence of his dismissal, a ruined man in this country, he "must start with his little capital in a fresh field," where he hoped to become sufficiently prosperous to make everything good.

Mr. *W. H. Harding*, the accountant and secretary, having been examined, the prisoner was remanded for a week.

Miscellaneous News.

THE GAS REFEREES AND THE BOARD OF TRADE.

The following letter has been addressed to the Board of Trade by the Gas Referees, in reference to a letter to the Board from the Secretary of The Gaslight and Coke Company, which has already appeared in our columns:—

17, *Buckingham Street, Adelphi, W.C., April* 19, 1877.

Sir,—We beg leave to acknowledge the receipt of a copy of a letter addressed to you by the secretary of The Gaslight and Coke Company on the 7th inst.

We notice with regret the hostile spirit manifested towards us in that communication, and as we believe this hostility to arise from a misapprehension of some remarks in our letter of the 5th of March, we desire to use the present opportunity of rendering our meaning unmistakeable.

In witnessing the discharging of the purifiers, at those stations regarding which complaints of nuisance had been made, we were struck by the fact that in no two cases was the mode of working the same. At one station, the actual emptying of the purifiers was conducted under cover, and no unpleasant smell escaped; but the refuse lime was afterwards shot into barges, with no protection from the wind, and thus a decided nuisance was created. At another station, the conveyance of the refuse lime into barges was effected under cover, and without nuisance; but, during the actual emptying of the purifiers, the foul substance was freely exposed to the action of the wind. At other stations, no precautions whatever were taken, either in emptying the purifiers or in removing the lime.

It seemed to us that if the precautions which we witnessed at different stations were properly combined, complete success would be the result; and we also thought that the cause of the observed want of unity in the methods of dealing with the same problem at different stations, might be justly, and without offence, referred to the absence of a chief engineer, entrusted with the power of bringing into general use whatever special ameliorations the experience or ingenuity of the superintendents of the different stations had devised.

It was very far indeed from our intentions to "indulge in personality at the expense of the company's engineers," or to "disparage" them, nor do we believe that any language of ours is fairly open to this interpretation. We know how small a place such a question as that of discharging a lime purifier can occupy in the thoughts of the busy manager of large gas-works; and we are quite prepared to accept the statement of the secretary, that there is not "any other company, metropolitan or provincial," able "to show results of working superior to those which are achieved by the engineers of The Gaslight and Coke Company."—We are, Sir, your obedient servants,

(Signed) A. VERNON HARCOURT.
JOHN TYNDALL.

The Assistant Secretary, Railway Department, Board of Trade.

THE REGISTRAR-GENERAL ON THE WATER AND GAS SUPPLY OF THE METROPOLIS.

[From the *Registrar-General's Annual Report.*]

WATER AND GAS.*

The water London requires now comes from a distance, and is distributed by companies at a cost of £1,197,306; of which £445,768 goes in working expenses, and £751,538 in the profits of capital. The cost of the existing capital is at the rate of 6·5 per cent.

London gets its gas through companies from the coal imported at a cost of £2,650,284 for the supply through meters. The working expenses are £2,506,061; but in addition to the meter-rents the companies get £780,781

* *London Water and Gas Companies.*—Total paid-up capital (including amount received on calls paid in advance), revenue, and expenditure of the Metropolitan Gas and Water Companies for the last financial year ended prior to April 1, 1876.

—	Total Paid-up Capital (including Calls Paid in Advance).	Total Gross Revenue.	Revenue from Gas, Meter, and Water Rents.	Total Working Expenditure.
	£	£	£	£
Gas companies	11,005,591	3,431,065	2,650,284	2,506,061
Water companies . . .	11,486,566	1,197,306	1,180,939	445,768

from the sale of coke and from other sources, making the gross revenue £3,431,065; and the profit £925,004, that being the difference between the working expenses and the gross revenue. The profits of capital are at the rate of 8·4 per cent.

The capital engaged in the gas and water companies is £22,492,157; which realized in the year that ended on April 1, 1876, no less than £1,676,542. That was 7½ per cent. all round. Now, if this amount of capital were required to construct all the works necessary to supply London with the best gas, and pure soft water at high pressure, the capital could probably be raised at 4, or certainly at 3½ per cent. less than is now paid in dividends. If the capital were raised at 4 per cent., £776,856 would be set free; out of which, after the companies were adequately compensated, there would be a large revenue for education and for many municipal purposes. Such is the tax under which London suffers from the want, years ago, of an intelligent, enterprising municipal organization. Though the companies have no explicit monopoly, still they necessarily act precisely as a company would which had the supply of bread exclusively in its hands, or as a great candle company that supplied light would under the same circumstances; they would fix the prices of these necessaries of life—bread and light—so as to earn the highest dividends.

It is not only the tax, which threatens to be perpetual in the case of virtual monopolies, but the difficulty of getting such improvements as the age demands in the character of the articles supplied. Water is now required in London soft, pure, aërated, and distributed on the constant system, in pipes, under pressure such as would pour floods of water through hydrants on burning houses and piles of warehoused goods. But that would involve expenditure and diminished dividends, to which no body of shareholders will willingly submit. So long as their customers are quiet they will supply the cheapest article at the highest price.

Dr. Frankland has continued his analyses of the London waters supplied by the several companies from the Thames, from the Lea, and from chalk wells. The results are full of interest, and are useful to the companies themselves.

According to these returns the eight companies supplied, on an average, 527,434 houses and establishments with 538,926 cubic mètres (equal to nearly as many tons) daily.

METROPOLIS WATER SUPPLY.

Report on the Analysis of the Waters supplied by the Metropolitan Water Companies during the several Months of the Year 1876.

By Professor Frankland, D.C.L., F.R.S., &c.

[*From the Registrar-General's Annual Report.*]

Royal College of Chemistry, Jan. 30, 1877.

Sir,—I have to submit to you, in the accompanying tabular statements, the results of the chemical examination of the water supplied to London by the eight Metropolitan Companies during the year 1876.

The temperature of each sample at the time of collection, and the condition of the water as regards clearness or turbidity, has been recorded, and in all cases of turbidity a microscopic examination of the sediment deposited by the water on standing has been made.

Table A gives the temperature of the water as it flowed from the main at the time of collection. Classifying the waters in three groupes according to their sources, the following variations of temperature were observed:—

The temperature of the Thames water supplied by the Chelsea, West Middlesex, Southwark, Grand Junction, and Lambeth Companies, varied from 1·0° C. (33·8° Fahr.) in January, to 21·5° C. (70·7° Fahr.) in July and August.

That of the Lea water, delivered by the New River and East London Companies, ranged from 1·5° C. (34·7° Fahr.) in January, to 21·2° C. (70·2° Fahr.) in August.

The Kent Company's deep well water showed a minimum temperature of 10° C. (50° Fahr.) in January, and a maximum of 17° C. (62·6° Fahr.) in October. The latter comparatively high temperature was observed only once, and was probably due to some accidental circumstance. Omitting this observation, the maximum was 14·5° C. (58·1° Fahr.)

Thus it will be seen that the temperature of the river waters varied according to the season, ranging through no less than 19·7° C. (35·5° Fahr.); consequently they were in imminent danger of freezing in winter, and they were vapid and unpleasantly warm in summer. The range of temperature in the deep well water was much smaller, and extended through only 7° C. (12·6° Fahr.); or, omitting the one abnormal observation just referred to, through only 4·5° C. (8·1° Fahr.)

Table B shows the amount of solid impurity contained in 100,000 parts by weight of water. This solid matter is composed of a great variety of substances, by far the largest proportion being entirely harmless when the water is used for dietetic purposes, but decidedly injurious when it is used for washing. A small proportion of the total solid impurity consists of organic matter. This is always objectionable, and at times, when present in river water, it is dangerous to health. The average proportion of solid matters in all the three classes of waters was nearly the same last year as in 1875, there being a very slight increase in the Thames and deep well water and a very slight decrease in the Lea water.

Tables C and D exhibit the proportion of organic impurity actually present in the waters, as represented by the two most important constituents of organic matter, carbon and nitrogen. The importance of these indications depends chiefly on the fact that the pollution of the Thames and Lea is to a great extent of animal origin. On the whole, the year 1876 was very favourable for the river waters. Up to the end of November the rainfall was greatly below the average, and in consequence much polluting matter, which would otherwise have been washed into the rivers, was retained nearer to its source. In the months of February, May, June, July, August, September, and November, the river waters contained very much less organic impurity than usual; indeed, in August and October the water delivered by the New River Company was chemically purer than the deep well water of the Kent Company, although the latter maintained its usual excellent quality. When, however, the heavy rains of December set in, the accumulated filth of the summer and autumn was swept into the neighbouring streams, the Thames overflowed its banks, washing the manure from cultivated land, and liberating the water from stagnant ponds and ditches. Thus during the last month of the year the Thames was laden with organic matters of the most objectionable origin, which were carried down to the intakes of the Metropolitan Water Companies; they passed through the filters and were distributed to consumers.

Since January, 1873, the Thames has never been in such a filthy plight, and although most of the water companies drawing from this river have greatly improved their subsidence and filtration plant since that date, no care, foresight, or appliance could convert the "puddle" (to quote an entry in the books of the West Middlesex Company) which entered the companies works into wholesome potable water, fit for dietetic purposes. These uncontrollable and frequently occurring outbreaks render this river a very undesirable source of water for domestic use.

Taking the mean proportion of organic impurity in the Thames water delivered in London in 1868 as 1000, I find that in subsequent years, 1876 included, the following proportions were present:—

Year.	Proportion of Organic Impurity present in Thames Water as delivered in London.
1868	1000
1869	1016
1870	795
1871	928
1872	1243
1873	917
1874	933
1875	1030
1876	903

The greatest organic pollution in the water drawn from the Thames occurred in January, March, April, October, and December, when the water was not fit for dietetic purposes. Of the five companies drawing from this river the West Middlesex Company delivered as usual the best, and the Southwark and Vauxhall Company the worst water.

The Lea is a more manageable stream, it receives a much smaller proportion of polluting matter, and rarely overflows its banks; consequently the water drawn from this source by the New River and East London Companies, and distributed after efficient filtration to nearly one-half of the inhabitants of London, is of much better quality, even after exceptionally heavy rainfall.

The most serious pollution of the Lea occurred in March; but even on this occasion the water was better than that drawn from the Thames in any of the months just mentioned.

Taking, as before, the mean proportion of organic impurity in the Thames water supplied to London in 1868 as 1000, I find in that and subsequent years, down to 1876 inclusive, the following proportions in the Lea water delivered by the New River and East London Companies:—

Year.	Proportion of Organic Impurity present in Lea Water as delivered in London.
1868	484
1869	618
1870	550
1871	604
1872	819
1873	693
1874	583
1875	751
1876	562

Table E. The deep well water distributed by the Kent Company continues to be distinguished from the other supplies by containing a less proportion of organic matter, and, on this account, is again taken as the standard for comparison in the table. Taking the amount of organic elements (organic carbon and organic nitrogen) found in it during the past year as unity, the maximum, minimum, and average proportions in each of the other seven metropolitan waters supplied during 1876 were as follows:—

Sources.		Max.	Min.	Average.
Deep wells	Kent	1·0	1·0	1·0
River Lea	New River	3·3	0·9	1·9
	East London	4·0	1·7	2·8
Thames	West Middlesex	6·7	1·8	3·3
	Grand Junction	7·6	1·9	3·6
	Chelsea	7·0	1·9	3·9
	Lambeth	6·2	1·7	4·0
	Southwark	9·5	2·0	4·4

This Table shows that whilst all the river waters are, on the average, of a much lower quality than the deep well water of the Kent Company, the degree of their impurity varies between wide limits; thus the maximum proportion of organic impurity in the Southwark Company's water was nearly three times as great as that in the New River Company's supply.

Tables F and G ("Ammonia," and "Nitrogen as nitrates and nitrites," in 100,000 parts of water) need no comment.

Table H shows the total weight of combined nitrogen, which, after deducting a small correction for that present in average rain water, constitutes the total evidence both of past and present pollution by nitrogenous organic matter.

During the spring and summer months the combined nitrogen in river water is largely diminished by the abundant animal and vegetable life then existing in the streams, and consequently, as an indication of pollution, the combined nitrogen found during the autumn and winter months only should receive consideration. During the months of January, February, March, October, November, and December, 1875, the average proportion of total combined nitrogen in 100,000 parts of Thames water was ·337 part; in the same period of 1876 it was ·312 part. In the same quantity of water derived from the river Lea it was ·314 part in 1875, and ·294 part in 1876.

The deep well water supplied by the Kent Company is unaffected by animal or vegetable life, and the average may therefore be taken on the whole year. In 1875 it was ·437 part, and in 1876 ·423 part. Thus the total combined nitrogen has slightly decreased in all the three waters.

Table I gives the *past* as distinguished from the *present* or existing contamination of the water by sewage and animal substances, showing, in terms of average London sewage, the proportion of previous animal contamination as estimated from Tables F and G. This evidence is defective in river water during the spring and summer months, for the reasons which have been given as affecting the results expressed in Table H. Such action of animal and vegetable organisms may even obliterate altogether the evidence of previous sewage pollution; and it has actually done so during the past year, on one occasion, in the case of the East London Company's water. This water arrives at the company's intake exhibiting considerable evidence of previous contamination by animal organic matter, but it is stored for a period of from two to three weeks before being filtered, and during its continuance in the reservoirs the evidence of previous contamination becomes effaced. This evidence is of importance in the Thames and Lea water, owing to the likelihood of morbific matter derived from animal excreta being carried down the stream without undergoing decomposition. But it need not be regarded in the water of deep wells in the chalk, as the slow and therefore extremely efficient filtration which the water undergoes in passing through so great a thickness of chalk is an ample protection.

Table K exhibits the quantity of chlorine found in the various samples. The results obtained prove that the tidal waters of the Thames and Lea had, in no case during 1876, obtained entrance to the reservoirs or filters of the water companies.

Table L shows the hardness of the samples analyzed or the weight of carbonate of lime, or its equivalent of other soap-destroying substances, found in 100,000 parts of water. The average hardness of the Thames water was 20° or parts in 1875, and 19·8° or parts in 1876; of the Lea, 20·4° or parts in 1875, and 20·1° or parts in 1876; and of the Kent Company's water, 25·9° or parts in 1875, and 26·8° or parts in 1876.

Large quantities of soap or soda are required to soften these waters before they are used for washing. This softening could be accomplished for a small fraction of the expense before the distribution of the water by

the use of lime, as practised on similar waters at Aylesbury, Canterbury, Caterham, Tring, and Bushey.

Lastly, Table M shows the annual average of each determination, thus summarizing the average results of analysis of the water supplied by each company during the year.

The following table exhibits the results of my observations as to the degree of efficiency of filtration of Thames and Lea water distributed by the various companies in 1876:—

	No. of Occasions when Clear and Transparent.	No. of Occasions when slightly Turbid.	No. of Occasions when Turbid.	No. of Occasions when very Turbid.
Thames.				
Chelsea	7	4	1	0
West Middlesex	12	0	0	0
Southwark	5	6	1	0
Grand Junction	8	4	0	0
Lambeth	8	4	0	0
Other Sources.				
New River	12	0	0	0
East London	12	0	0	0
Kent	12	0	0	0

The natural filtration which the Kent Company's deep well water undergoes through an enormous thickness of chalk renders artificial filtration unnecessary, and is the cause of its uniform clearness and transparancy.

This table shows that the West Middlesex, New River, and East London Companies only, out of the seven which supply river water to London, uniformly delivered the water in an efficiently filtered condition.

Since the year 1868, when I first instituted these observations, the filtration of the river water has undergone great and continuous improvement. Thus, during the year 1868, seven samples of water were *very* turbid when drawn from the mains; in 1869 six samples were very turbid; four in each of the years 1870 and 1871; in 1872 only one sample was very turbid; in 1873 none; in 1874 the Chelsea Company's water reached that degree of muddiness on two occasions, but since that date no sample has been drawn in a *very* turbid condition from any main in the Metropolis.

When examined by the microscope, the sediment deposited by turbid water on standing is almost always found to contain numbers of living and moving organisms. During the year 1876 such organisms were observed in the Chelsea and Lambeth Company's water four times each, in the Southwark Company's water seven times, and in the water of the Grand Junction Company three times. The annexed table exhibits the results of such microscopic examinations during the past eight years:—

	Number of Occasions when Moving Organisms were Found.							
	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.
Chelsea	3	2	2	3	2	5	4	4
West Middlesex	0	0	0	0	0	0	0	0
Southwark	8	1	4	1	2	5	5	7
Grand Junction	4	1	1	2	3	5	7	3
Lambeth	5	0	4	6	3	4	5	4
New River	0	0	0	0	1	1	0	0
East London	4	3	3	1	0	2	0	0
Kent	0	0	0	0	0	0	0	0

The following are the returns of the Society of Medical Officers of Health, on the composition and quality of the metropolitan waters in April, 1877:—

Names of Water Companies.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen. — As Nitrates, &c.	Ammonia. — Saline.	Ammonia. — Organic.	Hardness (Clarke's Scale). — Before Boiling.	Hardness (Clarke's Scale). — After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	20·80	0·064	0·129	0·000	0·009	14·3	3·7
West Middlesex	19·80	0·057	0·120	0·001	0·009	13·2	3·3
Southwark and Vauxhall	20·80	0·067	0·120	0·001	0·009	13·2	4·2
Chelsea	20·80	0·071	0·150	0·000	0·008	13·7	3·7
Lambeth	21·10	0·070	0·174	0·001	0·008	13·7	3·7
Other Companies.							
Kent	27·90	0·006	0·350	0·000	0·003	18·8	5·6
New River	16·80	0·042	0·105	0·000	0·006	13·2	3·7
East London	19·60	0·060	0·129	0·001	0·008	12·6	3·5

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and in the case of the metropolitan waters the quantity of organic matter is about eight times the amount of oxygen required by it.

The water was found to be clear and nearly colourless in all cases but the following, when it was slightly turbid, namely:—Lambeth, Southwark and Vauxhall.

C. Meymott Tidy, M.B.

SINGAPORE GAS COMPANY, LIMITED.

The Annual General Meeting of this Company was held at the Cannon Street Hotel, London, on Tuesday, April 24—H. P. Stephenson, Esq., in the chair.

The Secretary (Mr. R. King) read the notice convening the meeting, and the following reports and statements of accounts were submitted:—

The directors have the satisfaction of reporting continued progress in the lighting of Singapore, for particulars of which they refer to the report annexed, from their engineer and manager, Mr. E. J. Wells, dated Feb. 23, 1877.

The directors going out of office by rotation are Messrs. Henry Palfrey Stephenson and Frederick Alexander Malcolm Nicol; and these gentlemen, being eligible for re-election, offer themselves for the support of the shareholders. The present auditors, Messrs. William Thomas Morrison and Alfred Williams, retire from office according to the articles, and, being eligible for re-election, offer themselves to the shareholders for that purpose.

The balance-sheet to Dec. 31, 1876, appended to this report, shows the financial position of the company. The directors have written off for depreciation of works and plant, and off the expenses of first establishment, as per balance-sheet, at the rate of 1 per cent. per annum for the present half year, and one-half per cent. per annum for the half years ending Dec. 31, 1874, and June 30, 1875, during which half years the profits would not admit of the usual amount being written off on this account. The profit for the half year, after writing off these sums, amounts to £2650 9s. 7d., which, together with £167 4s. 9d., the unappropriated profit of the preceding half year, makes the available balance £2817 14s. 4d.; out of this sum the directors recommend the declaration of a dividend at the rate of 7½ per cent. per annum, less income-tax, on the amounts paid up on the preference and original capital; the balance of £626 18s. 3d. to be carried forward to the profit of the succeeding half year, the dividend to be payable on May 21.

Report of Engineer and Manager.

Gas-Works, Singapore, Feb. 23, 1877.

Gentlemen,—At the close of another half year I have again the honour of laying before you my report. It affords me very great pleasure to be able to forward you statements of accounts showing a satisfactory working on the half year. The complete sets of balance-sheets, statements, &c., were sent from here by the mail of the 25th ult. I hope they reached you safely, and that they furnished the directors with all the information required in the preparation of the balance-sheet.

The working in the carbonizing department you will note has been very good as compared with the corresponding half year, there being a decrease in the first cost of coals, with an increased gas-rental of 2105·93 dols. The residual products also show an increase of 1054·05 dols. over the same period. It is not necessary for me to take up your time further on the accounts, as most of the other items remain about the same, and everything is fully detailed in the statements sent.

The efficiency of the works, mains, plant, and buildings has been well maintained; repairs have been executed where necessary. All the ironwork in gasholders, &c., has been tarred; all the woodwork in houses and stores has been painted, so that everything is in good condition for produce and supply.

The No. 1 gasholder, after being at work 13 years, shows no sign of decay.

In the retort department the two new benches of retorts are working satisfactorily. Nos. 2 and 3 benches of retorts have been re-set on the same principle as the above; there are now four benches of retorts ready for use when required, which places the company in a very satisfactory position. I do not anticipate any further outlay in this department for some time to come, beyond the necessary expenditure upon wear and tear.

There are two or three important points connected with the works here, which I think will not be out of place to note. The first is burners. Previous to the last three years the ordinary burners have been used; these have been a continual source of expense and annoyance, as an ordinary iron burner becomes useless in a few months. I have tried several of the steatite tips, but they did not meet the difficulty. About three years ago I received some of Bray's burners, which answer the purpose, and give every satisfaction. I have now fully adopted them, and have entirely discarded iron burners.

Secondly, Normandy's patent joints. I had occasion to break the main to insert a tee-piece for the new benches of retorts, and previous to that for repairs to a valve; I found that the Normandy joints, after being laid 13 years and taken to pieces, the india-rubber was quite sound and pliable.

Thirdly, Donkin's valves. These valves are used throughout the works, and have worked quite satisfactorily ever since the works were opened; only in three or four instances the spindles have been renewed. There is one valve used daily for the ammoniacal liquor, and is now quite sound.

In the purifying department the working still continues satisfactory; the illuminating power has been maintained.

The unaccounted-for gas for the half year has been 13 per cent.

The extension in the Havelock Road has not yet been carried out, but will be as soon as possible. With the change of the last monsoon a very wet season set in, and for upwards of three months there was a very heavy rainfall. The Havelock Road lying low, nothing could be done; also an unfortunate fatal accident occurred to the main-layer, and I have not yet been able to replace him. The fitters on the whole have been well employed, but the Chinese new year occurring during the present month, they are not now so busy.

The rates of exchange, I am happy to state, have been more favourable during the past half year, the loss of exchange on £5827 12s. 1d. remitted to England being £386 14s. 6d., as against £384 18s. 2d. on £3000 remitted in the previous half year.

The collection on the whole has been satisfactory; 39,571·05 dols. has been collected and paid to the bank. I should have liked to have had more collected; the collectors, however, have worked well, but trade has been dull, and money very scarce.

During the half year 36 new houses have been fitted up with burners, and 7 original houses have again been laid on.

The number of lights fitted up, including additional ones, was 400.

(Signed) E. J. Wells, Manager.

Dr. *Balance-Sheet, Dec.* 31, 1876. *Cr.*

Capital—				Cash at bankers, London and Singapore		£713 15 2
£5 paid on 2000 preference shares	£10,000	0	0	Ditto in hands of secretary		1 5 4
£5 paid on 9848 ordinary shares	49,240	0	0	Bills receivable		4,117 3 9
£4 paid on 175 ordinary shares	700	0	0	Office furniture		124 14 6
£3 paid on 499 ordinary shares	1,497	0	0	Cost of works & plant, as per last statement	£35,152 3 0	
£2 paid on 25 ordinary shares	50	0	0	Add, extensions during the half year	98 3 3	
£1 paid on 50 ordinary shares	50	0	0		£35,250 6 3	
12,597 shares	£61,537	0	0	Less depreciation at the rate of 1 per cent. per annum, for the present half year	£175 15 3	
Debenture bonds	3,910	0	0	Ditto at the rate of ¼ per ct. per ann. for the half year ending Dec. 31, 1874	82 9 11	
Sundry creditors	337	17	7	Ditto, June 30, 1875	84 19 3	
Insurance reserve-fund	71	5	4		343 4 5	
Profit and loss	2,817	14	4			34,907 1 10
				Purchase of land		1,118 2 8
				Retort account		1,413 6 10
				Meter renewal account		82 4 0
				Stock on hand		11,014 15 8
				Amounts charged to capital for travelling expenses, rent, preliminary expenses, and interest on capital during construction	£10,840 5 11	
				Less amount previously written off	742 13 3	
					£10,097 12 8	
				Less amount written off this half year, at the rate of 1 per cent. per annum	£54 0 0	
				Ditto, half year ending Dec. 31, 1874, at the rate of ½ per cent. per annum	27 0 0	
				Ditto, June 30, 1875	27 0 0	
					108 0 0	
						9,989 12 8
				Gas, meter-rental, fittings, and sundries under collection to Dec. 1		2,484 11 5
				Gas, meter-rental, &c., for the month of Dec., and gas for public lamps for the half year		2,707 3 5
	£68,673	17	3			£68,673 17 3

Profit and Loss Account, from July 1 *to Dec.* 31, 1876

Coal carbonized	£2,403	4	0	Balance at profit and loss, June 30, 1876		£2,254 16 2
Lime and oxide	21	6	5	Less amount declared as dividend, after deducting income-tax on ordinary and preference shares		2,087 11 5
Trade & general charges	454	11	6			£167 4 9
Rent, rates, and taxes	101	7	9	Gas and meter rental		6,438 18 0
Directors and auditors	210	10	0	Products, profit on fittings, and sundries		1,867 12 10
Salaries and collectors commission	709	14	8			
Wages	409	6	7			
Interest on loans and debentures	194	13	11			
Interest on calls paid in advance	44	5	0			
Loss on exchange	386	14	6			
Bad debts and allowances	64	2	6			
Retort account	120	0	0			
Meter renewal account	75	0	0			
Depreciation on works and plant, & expenses of first establishment written off	451	4	5			
Office furniture	10	0	0			
Balance—profit for appropriation	2,817	14	4			
	£8,473	15	7			£8,473 15 7

The CHAIRMAN, in moving the adoption of the report, said: Turning to the balance-sheet, and comparing it with the corresponding half year, Dec. 31, 1875, we find the following:—On the debit side the share capital has increased £6392, our debenture bonds have decreased £2210, the profit (including the balance brought forward) is £664 more. On the credit side the cash at bankers, bills receivable, &c., have increased £1482. Stock has increased £3000, there being a larger stock of coals. Turning to the profit and loss account, on the debit side the coal is £322 less, whilst on the credit side gas and meter rentals have increased £494, and products, &c., have increased £212, resulting, as before stated, in an increased profit (with the balance brought forward) of £664. We declare our usual dividend on both classes of shares, and we are enabled not only to deduct our usual amount of depreciation on works and plant, &c., but also to deduct back depreciation, which we could not do at the time, as the profit would not then admit of its being done.

Mr. R. S. FOREMAN seconded the motion, which was put and carried unanimously.

The CHAIRMAN moved, and Mr. F. W. COLLARD seconded, the following resolution, which was also unanimously accepted:—"That a dividend be declared to the preference and ordinary shareholders at the rate of 7½ per cent. per annum, less income-tax in both cases, on amounts paid up on their shares from the respective dates of payment to Dec. 31, 1876, such dividends to become payable on May 21 next."

On the motion of Mr. R. RICE, seconded by Mr. H. W. SMITH, the retiring directors, Messrs. H. P. Stephenson and F. A. M. Nicol, and the retiring auditors, Messrs. W. T. Morrison and A. Williams, were severally re-elected, the remuneration of the auditors for the ensuing year being fixed at ten guineas each.

The CHAIRMAN moved, and Mr. D. HULETT seconded—"That the thanks of the shareholders be given to the local committee at Singapore for their attention to the business of the company."

The motion having been carried unanimously, a similar compliment was paid to Mr. E. J. Wells, the company's engineer and manager at Singapore, for his energy and careful management of the company's affairs at Singapore.

It was proposed by Mr. D. HULETT, seconded by Mr. H. W. SMITH, and carried unanimously—"That the thanks of the shareholders be given to the directors for their superintendence of the business of the company."

The CHAIRMAN, in reply, acknowledged the compliment paid, and expressed the appreciation, on the part of the board, of the confidence reposed in them. Referring to a suggestion made, as to looking forward to an increase of dividend, he said the directors were anxious to increase the amount, but then only when they felt that such increase would be of a permanent character. On this point he held a very strong opinion. Over-hasty increase of dividend enabled speculators on the Stock Exchange to trade upon companies, but was certainly not beneficial to the companies themselves.

It was proposed by Mr. R. RICE, seconded by Mr. T. A. GREEN—"That the thanks of the shareholders be given to Mr. R. King, the company's secretary and engineer, for his uniform courtesy and attention to the shareholders and the business of the company."

Mr. KING having replied, the meeting separated.

WIGAN CORPORATION GAS-WORKS.

The following abstract of accounts for the past half year has just been published:—

Statement of Loan Capital on Dec. 31, 1876.

Description of Loan.	Rate per Cent. of Interest.	Total Amounts Borrowed at Dec. 31, 1876.	Remaining to be Borrowed.	Total Amounts Authorized.
Debenture stock.	4½ per cent. per annum.	£140,638 11 11	£9,361 8 1	Amount authorized by Wigan Improvement Act, 37 & 38 Vict., 1874. . . £140,000 Amount sanctioned by Local Government Board, Aug. 21, 1876 . . . . 10,000 £150,000

Note.—The Wigan Improvement Act, 37 & 38 Vict., 1874, empowers the corporation, with the sanction of the Local Government Board, to borrow an additional amount not exceeding £40,000, for the extension and improvement of the gas-works.

Dr.—Capital Account.

	Expenditure to June 30, 1876.	Expended this Half Year.	Total to Dec. 31, 1876.
	£144,255 0 7½	..	£144,255 0 7½
New buildings, manufacturing plant, machines, storeage works, and other structures connected with manufacture	..	£3,037 17 9	
New mains and service-pipes (not being in place of old ones), including laying same, paving, and other works connected with distribution.	..	2,050 5 11½	
New meters (not in place of old ones)	..	359 11 1	
			5447 14 9½
			£149,702 15 5
Balance of capital account	..	..	1,866 11 7
			£151,569 7 0

Cr.—Capital Account.

	Certified Receipts to June 30, 1876.	Received during Year.	Total Receipts to Dec. 31, 1876.
Debenture stock	£140,638 11 11		
Amount representing reserve-fund, taken over from the old Wigan Gas Company . . . . £7619 14 5 Less amount paid for interest to debenture stockholders, 1875. £2636 16 1 Balance in Bank, June 30, 1876. 2238 11 7	4875 7 8		
	2,744 6 9	..	£143,382 18 8
Bankers.	£3,055 1 1	£5,131 7 3	8,186 8 4
			£151,569 7 0

Dr.—Revenue Account.

To Manufacture of gas—		
Coals, including dues, carriage, unloading, and all expenses	£6,368 14 3	
Purifying materials, oil, water, &c.	58 14 9½	
Salaries of engineer, including chief engineer, &c.	150 0 0	
Wages and gratuities at works	1,446 0 10	
Repairs and maintenance of works and plant, &c.	608 13 9	
		£8,632 3 7½
Distribution of gas—		
Salaries of surveyors, chief inspector, inspectors, &c.	£35 3 8	
Repairs, maintenance, and renewal of mains, &c.	133 13 4	
Repairing, renewing, and refixing meters. . .	32 0 0	
		200 17 0
Public lamps—		
Lighting and repairing, &c.		24 4 5
Rents, rates, and taxes—		
Rates and taxes		536 7 7
Management—		
Salaries of secretary, accountant, and clerks, office keepers, &c.	£120 16 4	
Collectors commission, &c.	60 0 0	
Stationery and printing, &c.	55 3 10	
Auditor	12 10 0	
		248 10 2
Sundries—		
Discounts and allowances	£1,229 3 6½	
Gas consumed on works	100 0 0	
Horse keep, &c.	42 4 5	
		1,371 7 11½
Total expenditure		£11,013 10 9
Balance carried to profit and loss account		10,047 12 11½
		£21,061 3 8½

Cr.—Revenue Account.

By Sale of gas—		
Sale of gas	£13,429 6 1½	
Rents of meters	463 14 3	
Public lighting, &c..	1,777 15 6½	
		£15,670 15 11
Residual products—		
Sale of coke	£2,503 12 7	
Do. tar	1,648 15 2	
Do. ammoniacal liquor	732 9 1	
		4,884 16 10
Sale of fittings, &c.		430 10 11½
Rents, &c.		75 0 0
		£21,061 3 8½

Dr.—Profit and Loss Account.

To Balance (being loss) brought forward from last account		£2,189 2 9½
Interest on debenture stock to Dec. 31, 1876 . . .	£2,995 16 8	
Interest and commission on balances owing bankers to Dec. 31, 1876.	411 2 6	
		3,406 19 2
Amount set aside to meet bad debts		300 0 0
Balance of net profit to be carried to next account		4,151 11 0
		£10,047 12 11½

Cr.—Profit and Loss Account.

By Balance brought from revenue account, being profit for half year ending Dec. 31, 1876	£10,047 12 11½
	£10,047 12 11½

Dr.—Reserve-Fund Account.

To Amount of balance carried to next account.	£2,289 7 0
	£2,289 7 0

Cr.—Reserve-Fund Account.

By Balance brought from last account	£2,238 11 7
Interest on amount invested	50 15 5
	£2,289 7 0

Statement of Coals.

Description of Coal.	In Store, June 30, 1876.	Received during Half Year.	Carbonized or Used during Half Year.	In Store, Dec. 31, 1876.
	Tons.	Tons.	Tons.	Tons.
Common	1172	8907	9979	100
Cannel	2200	..	1480	720

Statement of Residual Products.

Description of Residual.	In Store, June 30, 1876 (estimated).	Made during Half Year (estimated).	Used in Manufacture during Half Year (estimated).	Sold during Half Year.	In Store, Dec. 31, 1876 (estimated).
Coke, chaldns. (18 cwt.)	244	10,822	2336	3480	5250
Breeze ,, . . .	...	...	..	...	...
Tar, tons	384	721	..	354	751
Ammoniacal liq., tons	..	1,327	..	82	1245

Dr.—General Balance-Sheet.

To Capital account, balance at credit thereof	£1,866 11 7
Profit and loss account, balance at credit thereof	4,151 11 0
Amount set aside to meet bad debts	300 0 0
Reserve-fund account, balance at credit thereof	2,289 7 0
Interest accrued and unpaid on debenture stock to Dec. 31, 1876 . .	2,988 6 4
Sundry tradesmen and others, for amount due for coals, stores, &c., to Dec. 31, 1876.	3,455 5 6
Deposits, &c.	300 5 0
Bankers balance, amount owing on revenue account.	6,761 1 2
	£22,112 9 7

Cr.—General Balance-Sheet.

By Coals, for stock on hand, Dec. 31, 1876		£806 1 0	
Coke	ditto	1,575 0 0	
Tar	ditto	1,428 8 0	
Ammoniacal liquor	ditto	687 0 0	
Fittings and sundry stores	ditto	557 15 9	
Gas	ditto	76 16 6	
			£5,131 1 3
Gas and meter rental, balance of this account due to company on Dec. 31, 1876		£11,962 5 5	
Coke, &c.	ditto	793 5 5½	
Tar, &c.	ditto	438 14 10	
Fittings, &c.	ditto	1,453 19 6½	
			14,648 5 3
Cash in hand			43 16 1
Ditto at bankers, renewal-fund account.			2,289 7 0
			£22,112 9 7

LEICESTER GAS COMPANY.

An Extraordinary Meeting of Shareholders was held on the 23rd ult.—Mr. W. E. HUTCHINSON in the chair—"to consider and determine upon a proposed sale and transfer of the undertaking of the company to the mayor, aldermen, and burgesses of the borough of Leicester, upon the terms and conditions to be explained at such meeting; and if such sale be approved, then to affix the common seal of the company to an agreement with the said mayor, aldermen, and burgesses for carrying out the same."

The SECRETARY (Mr. Billson) having read the heads of the agreement,

The CHAIRMAN moved—"That the proposed sale and transfer of the undertaking of the company to the Corporation of the borough of Leicester, upon the terms set forth in the heads of agreement now read, be approved and confirmed; and that the directors be, and they are hereby authorized and empowered to settle the terms of an agreement to carry out such sale; and that the chairman be and he is hereby authorized to affix the seal of the company to such documents as may be necessary to give effect to this resolution." He said many of the shareholders, no doubt, would have been taken somewhat by surprise at the course which matters had taken between the company and the Town Council of the borough of Leicester. The change was rather a sudden one, and matters had proceeded at a somewhat rapid pace, and this was necessary if a very severe and costly contest in Parliament was to be avoided. He believed most of them would be acquainted with the discussion which took place in the Town Council on the subject of the Leicester Gas Bill, which had been duly reported in the newspapers, so that he could not add much information to that which they would have gleaned from those sources. It appeared to the directors that, in the course of that discussion, a strong desire was manifested, both by the council and the town, that some arrangement should be entered into which should preclude the necessity for a costly contest. That being the case, he thought if any communication was made that it should be brought before the directors, in order that it might be considered by them. In the course of time the thing ripened, so that negotiations were entered into for the transfer of the undertaking of the company into the hands of the Town Council. There were many reasons which weighed upon them in coming to the conclusion that it was desirable to entertain the project. They would be aware that the course of legislation of later times had been to vest these undertakings in the hands of corporations. And again, legislation in Parliament had taken rather a hostile course towards gas companies, especially in the matter of capital. The negotiations were conducted in a very amicable and conciliatory spirit, which was decidely manifested by the representatives of the corporation, and adequately met by the directors. The terms were described at some length in the heads of agreement, but he would briefly recapitulate them. With regard to pecuniary compensation, he might say that the purchase-money was to be calculated by the addition of one-seventh to the maximum dividends now paid by the company, so that the A shares would receive 26s. 3d. and 3-7ths, instead of the present maximum dividend. The B shares would receive 17s. 1d. and 5-7ths, and the C shares 16s. per share, instead of the present dividend of 14s. Of course, there were two sides to every bargain. The directors might not have obtained all that some shareholders might have desired to have; but, looking at the thing dispassionately, they believed it was a fair and reasonable bargain for both parties—that it was a good sale of the works by the company, and a good purchase on the part of the corporation. They did not hand over to the corporation a poor concern, which they would have difficulty in making pay, but it was one which had progressed, during the last 55 years, from no dividend at all up to the maximum allowed by Parliament. They would hand over to the corporation works which were second to none in the kingdom in point of capability for the work for which they were designed; and he must express the obligation they all felt to their managers, the Messrs. Robinson, and their predecessors, for the zeal, energy, and ability which had enabled them to bring the works to their present state of efficiency. It was painful to some of them, who had been so long connected with the concern, to have the prospect of being severed from them in the work which they had had the pleasure of superintending for so great a number of years; but the question was not individual feelings, as they had to consider what was best for the shareholders under all circumstances, and they unanimously came to the conclusion to recommend to them the heads of agreement which they had heard read, and which had already received the sanction of the Town Council, and now awaited the sanction of that meeting. The directors considered that they had been met very fairly, and they had endeavoured to act fairly. He hoped the shareholders would see the matter in the same light as the directors had seen it, and, if they could, unanimously agree to the resolution which he now moved.

Mr. FOXTON seconded the resolution.

Mr. GRAY asked for an explanation with regard to the second clause, as to the notice to be given by the corporation. He wanted to know whether there was to be a mutual arrangement between the shareholders and the corporation on the point of notice, or whether it was to be all on one side. It might be that some shareholder's property would have to be sold, and the proceeds distributed, and he wished to know if a shareholder could give six months notice to the corporation to have his money, as well as the corporation giving the shareholder six months notice to pay his money in. If this could be done it would be more mutual. He did not think the corporation should have an advantage in this matter of arrangement. It appeared to him to be a point that might be very hard upon some of the shareholders, as it was well known that many of the shareholders were ladies, and circumstances were constantly occurring which would lead them to be obliged to have their money, and it might be at a time when it would not be convenient for the corporation to pay, and they would have to sell their shares at a time, perhaps, when money was dear. He thought the shareholders should have an opportunity of giving notice, and receiving the amount of their money in the same way as the corporation had of paying them off.

The CHAIRMAN said the clause referred to was that the option of giving six months notice would be entirely in the hands of the Town Council. The point was fully considered by the committee of directors in the first instance, and by the board at large. Of course, a great element in the negotiation was the facility with which the matter could be handed over to the corporation. They would not have obtained the terms they had done if there had been any compulsory power on the Town Council to pay them off at the option of shareholders. As to the difficulty which Mr. Gray had very properly alluded to, he thought it would not be serious. If any one wished to dispose of his shares, he would have the security of the profits of the corporation gas undertaking, and also the borough fund; and instead of having a dividend, which might be liable to fluctuation, he would have it guaranteed to him, which would materially benefit the shareholder. He had no doubt that, with such securities, the shares in the undertaking would be readily negotiated in the market.

The resolution was then put and carried unanimously.

Mr. R. TOLLER proposed a vote of thanks to the chairman for presiding, which was seconded by Mr. HOLYLAND, and carried.

The CHAIRMAN briefly replied, and the proceedings terminated.

PARIS GAS COMPANY.

The following Report of the Company's operations for the year 1876 was presented by the Board of Direction at the Annual General Meeting held in Paris on the 29th of March:—

Gentlemen,—In conformity with Article 23 of our statutes, we present to you our report on the company's operations for the year 1876, and acquaint you with the position of our undertaking on the 31st of December last.

During the year which has just passed away considerable progress was made in the consumption of gas. We should have been pleased to inform you that our profits had taken the same upward course; but different causes, the effects of which it has not depended upon us altogether to mitigate—notably the increase in the price of labour, the diminution in the value of silver, the exceptionally mild temperature which prevailed during the entire winter and suspended the sale of coke—have prevented us from attaining that result. We have, however, the satisfaction of announcing to you that we are in a position to pay you a higher dividend by 2 frs. than that for the year 1875.

GENERAL REVIEW OF THE COMPANY'S OPERATIONS.

Consumption of Gas.—During the past year, our works, ten in number, sent out for consumption a volume of gas equal to 189,209,789 cubic mètres (rather over 6679 million cubic feet), being 13,271,545 cubic mètres (nearly 468½ million cubic feet) more than in 1875.

This annual increase is lower than that for the year 1875, which reached 15,286,042 cubic mètres (539,597,000 cubic feet), but it considerably exceeds the annual increase of preceding years, which has always varied between 6 and 8 million cubic mètres (between 212 and 282 million cubic feet).

The day consumption, which takes place between the time for extinguishing and the time for relighting the public lamps, figures in the above total of 189,209,789 cubic mètres to the extent of 39,301,042 cubic mètres (1,387,826,000 cubic feet), and exceeds by 6,131,947 cubic mètres (216,458,000 cubic feet) the corresponding amount for the year 1875.

Receipts for Gas.—The produce of the sale of gas amounts to 46,248,120 frs. (about £1,849,925), exceeding by 2,776,833 frs. (about £111,073), or 6·38 per cent., the analogous receipts for the year 1875. These receipts may be apportioned as follows between the three districts supplied by the company:—

	Francs.	Sterling.
In Paris	35,713,216	£1,428,528
In the environs	7,606,911	304,277
In the outskirts beyond the fortifications	2,963,993	118,559
Total	46,284,120	£1,851,364

Consumers.—The number of consumers on Dec. 31, 1876, was 117,790, exceeding by 6569, or 5·90 per cent., the number at the same date in 1875. Of these 6569 new consumers, 4325, or nearly two-thirds, are supplied from the house services.

This proportion is very nearly the same as that for the year 1875, which procured us 6542 new consumers, of whom 4230 were supplied from the house services.

Public Lighting.—The number of public lamps in use on the 31st of December last was as follows:—

In Paris	21,191
In the environs	13,032
In the outskirts	5,957
Total	40,180

exceeding by 773 the number in use on Dec. 31, 1875. These additional lights may be distributed as follows:—

In Paris	144
In the environs	443
In the outskirts	186
Total	773

*House Services.**—These have become one of the most important branches of the company's operations. In our previous reports we have explained the methods by which we seek to increase the number of house services, and to render them more productive. These means, however, are still but little known, and in spite of our efforts to place gas within the reach of consumers, many persons are even now ignorant as to how they may procure it. We think, therefore, that, without repeating details contained in previous reports, it might be useful to profit by the publicity that will be given to the present one, to recapitulate the conditions on which the company undertake the gratuitous laying on of these services.

The company will gratuitously lay on a house service, with the branch-pipes connected therewith, in every house, either new or inhabited, the landlord of which undertakes, at his own expense, to make the necessary preparations for at least three lights in three apartments; and in order to compensate him in some measure for the expense attending this work, the company award him, once for all, a premium of 100 frs. When the landlord has the gas laid on to more than three apartments, the company add to this a further premium of 30 frs. for each three lights beyond the three required by their regulations.

A premium of 30 frs. is also awarded to every person, whether landlord or lodger in a house provided with a gas service, who for the first time brings into use an unproductive branch-pipe, by making, at his own expense, provision for the introduction of three gas-lights into an apartment.

When the company lay on a service to a house already inhabited, for the purpose of supplying gas in an apartment the lighting of which they consider will be sufficiently remunerative, they award the landlord who has been at the expense of fitting up the three burners a premium of 30 frs. In this case, however, he has no right to the premium of 100 frs.

Lastly, the company award a premium of 40 frs. to any workman, approved by them, who, at his own expense, risk, and peril, and on the condition that he relinquishes them gratuitously to the landlord, shall provide fittings for two lights on a branch previously unproductive, belonging to certain determined groups of pipes.

Such is the system of premiums actually in use, and the application of which has had the effect of raising, in the course of ten years, the annual income from the sale of gas supplied to consumers by means of these house services from 829,715 frs. to 5,389,372 frs. (£33,188 to £215,575).

We will now, gentlemen, lay before you an account of the results obtained from these services in 1876. During that year the company laid on 1386 house services, 113 on the application of landlords, and 1273 on the application of lodgers. Consequently, the total number in use on Dec. 31 last had been increased to 9257. This represents very nearly double the number existing on Dec. 31, 1872, or four years previously. These 9257 services, exclusive of their branch-pipes, taps, and meters, which are subject to a special payment, in conformity with police arrange-

* These house services, called *conduites montantes*, are pipes carried from the bottom to the top of the building, for the supply of flats and separate apartments, as in Scotland.

ments and the consumers contracts, cost 5,394,967 frs. (£215,799), which corresponds to an average cost of 583 frs. (£23 6s. 6d.) per service, being about equal to the average of 585 frs. stated on Dec. 31, 1875.

The receipts arising from the sale of gas supplied by these services in 1876 amount, as stated above, to 5,389,372 frs., showing an increase of 869,647 frs. (£34,786), or 19·2 per cent., on the analogous receipts for the preceding year, which amounted to 4,519,725 frs. (£180,789).

With regard to the number of consumers supplied from the house services, which on Dec. 31, 1875, was 22,480, at the corresponding date last year it had attained the figure of 26,805, representing a little over one-fifth of the total number of consumers.

Principal Results of Working.—The following table gives the quantity of gas manufactured from Jan. 1, 1856 to Dec. 31, 1876. It shows that during a period of 21 years the total increase has been 148,435,389 cubic mètres (about 5240 million cubic feet), or 364 per cent., the average annual increase having been 7,068,351 cubic mètres (249½ million cubic feet):—

Year.	Annual Consumption. Cubic Mètres. (1 c. m. = 35·317 c. ft.)	Annual Increase. Cubic Mètres. (1 c. m. = 35·317 c. ft.)	Annual Dividends. Francs.
1855	40,774,400	—	—
1856	47,335,475	6,561,075	40·00
1857	56,042,640	8,707,165	45·00
1858	62,159,300	6,116,660	50·00
1859	67,628,116	5,468,816	60·00
1860	75,518,922	7,890,806	70·00
1861	84,230,676	8,711,754	70·00
1862	93,076,220	8,845,544	85·00
1863	100,833,258	7,757,038	95·00
1864	109,610,003	8,776,745	105·00
1865	116,171,727	6,561,724	105·00
1866	122,334,605	6,162,878	110·00
1867	136,569,762	14,235,157	115·00
1868	138,797,811	2,228,049	120·00
1869	145,199,424	6,401,613	102·00*
1870	114,476,909	30,722,520 dec.	40·50†
1871	87,481,346	26,995,558 „	32·50
1872	147,668,331	60,186,985	51·00
1873	154,397,118	6,728,787	52·50
1874	160,652,202	6,255,084	55·00
1875	175,938,244	15,286,042	60·00
1876	189,209,789	13,271,545	62·00

Manufacturing Power.—The manufacturing plant upon the company's works at the end of last year represented a daily producing power of 935,000 cubic mètres (33 million cubic feet). Looking forward to an increase in consumption equal to that of the year 1876, we reckon on raising our producing power this year to 996,000 cubic mètres daily (rather over 35 million cubic feet), which corresponds very nearly to an annual make of 220 million cubic mètres (7766 million cubic feet). The available plant comprises, as usual, a reserve of 10 per cent., which is required in case of accident, and to meet any unforeseen increase in consumption.

Canalization.—During the past year important canalization works were carried out, for the purpose of extending or improving the distribution, and bringing more directly to the centre of Paris the gas made at the company's station at the Barrière d'Italie.

The total length of new mains laid was 28,774 mètres, apportioned as follows:—

	Mètres.	Yards.
In Paris	7,851	8,583
In the environs	11,809	12,911
In the outskirts	9,114	9,965
Total	28,774	31,459

The total length of mains laid under the public roadways on the 31st of December last had consequently been increased to 1,704,245 mètres, apportioned as follows:—

	Mètres.	Yards.
In Paris	701,689	767,180
In the environs	525,240	574,262
In the outskirts	477,316	521,865
Total	1,704,245	1,863,307

The greater portion of the main-laying work was undertaken, as usual, at the request of the municipal authorities, or in the execution of our contracts with the communes of the districts beyond the fortifications, as well as upon the requisition of private persons whose consumption ensured us a sufficient return for the outlay incurred.

We have recently negotiated with the commune of Montmagny a lighting contract, which is at present awaiting the approval of the *Administration Supérieure*. The conditions of this contract are exactly the same as those contained in contracts entered into with the other communes, and like them will expire with our concession on Dec. 31, 1905. When this contract comes into operation, the number of communes lighted by the company, in the departments of the Seine and Seine-et-Oise, will be fifty.

First Establishment Charges.

Property Acquired.—When we consider the rapid increase that has taken place in the consumption of gas, especially during the past two years, we are naturally led to ask whether the company, whose works already occupy a superficial area of 66 hectares (163 acres), possess sufficient land to give to their undertaking all the extension it requires, and allow it perfect freedom for development.

The acquisitions of land which have taken place during the past year, on very advantageous conditions, afford us the means of providing in a great measure for the future requirements of our works.

Works and Plant.—You know, gentlemen, that every year we are obliged to augment our productive power, in order to keep it in a condition to meet the probable exigencies of the consumption in the last days of December.

In 1876 this obligation was forced upon our attention so much more strongly, seeing that we had not only to provide, as in 1875, for an increase in consumption double that of preceding years, but moreover to augment our reserve plant, which, at the end of that year, was no longer in proportion to the plant in operation.

Mains, Services, &c.—The balance-sheet placed in your hands will show the manner in which the other first establishment charges are spread over the canalization works, house services, fittings and meters on hire, working plant, and general establishment expenses.

* This was the first year in which a division of profits exceeding 12,400,000 frs. took place with the Municipality of Paris.

† As in this year the shares were divided, these figures must be multiplied by 2 to render them comparable with those of the preceding years.

Account of First Establishment Charges for the Year 1876.

Expended in the Purchase of Land, &c.

	Francs.	Sterling.
Land acquired for the construction of new works at Clichy-la-Garenne	544,811	£21,793
Ditto for the extension of the works at St. Mandé	190,000	7,600
Ditto for the development of the tar-works at La Villette	183,960	7,358
Property acquired for the extension of the coke-store at the Vaugirard station	80,426	3,217
Ditto in the Faubourg Poissonnière for the extension of the offices of the Central Administration	163,132	6,525
Ditto in the Rue Rebeval, Paris, for the extension of the coke and other store houses at the Belleville station	32,000	1,280
Land acquired for the extension of the works at Ivry	12,400	496
Legal and other expenses in connexion with the above	156,726	6,269
Total	1,363,455	£54,538

Expended on Works and Plant.

La Villette.—Erection of two settings of eight through retorts; five gasholder-tanks and two gasholders, each of 15,000 cubic mètres (530,000 cubic feet) capacity; enlargement of condensing apparatus, erection of 56 purifying vessels and a station-meter house	2,114,156	£84,566
Les Ternes.—Gasholder-tank and holder of 20,000 cubic mètres (706,000 cubic feet) capacity, new condensing-pipes, repair and completion of the interior canalization on the works	649,581	25,983
Passy.—Telescopic gasholder of 8500 cubic mètres (300,000 cubic feet) capacity, heightening existing condensing-pipes	121,021	4,841
Vaugirard.—New purifying-house containing 12 purifiers, enlargement of coke-store, laying a 28-inch main between gasholders and valve-house	145,702	5,828
Ivry.—Erection of four settings of eight through retorts, with Siemens's generators; pipe condenser, and purifying-house containing 24 purifiers; two gasholders, each of 20,000 cubic mètres (706,000 cubic feet) capacity; cisterns and reservoirs for tar; coke-store, and stable for 90 horses; consolidation of the subsoil and foundations; enclosing and paving of works	2,113,574	84,543
Belleville.—Completion of a half setting of three through retorts, heated on Siemens's system; hydraulic mains and condensers	62,637	2,506
St. Mandé.—A second coke-crusher; two sets of six purifiers, with revivifying-sheds and storehouse	379,159	15,166
St. Denis.—Tar reservoir	3,319	133
Boulogne.—Pipe condenser, earthwork in lower portions of works, and completion of boundary wall	25,661	1,026
Maisons-Alfort.—Completion of a half setting of three through retorts, raising level of yard, and paving work	70,293	2,812
Tar-Works at La Villette.—A setting of six new coppers for the distillation of tar, pipework for the oils and essences, two steam generators, and a press for the manufacture of anthracene	159,991	6,399
Compressed Fuel Works.—Completion of the second machine for the manufacture of compressed fuel from coke dust; reservoirs, cranes, and heating apparatus	33,639	1,346
Works for the Treatment of Chemical Products.—Completion of two settings of coppers for the distillation of ammoniacal liquor at the St. Mandé works; new apparatus at La Villette for a similar purpose; wells, pumps, and reservoirs	110,733	4,429
Sundry works at the other stations of the company	70,027	2,801
Total	6,059,493	£242,379

Expended on Mains, Services, Fittings, &c.

Main-laying.—New mains laid during the year, and replacing old mains by others of larger diameter	1,345,657	£53,826
House Services.—Expenses of laying on, including premiums	770,653	30,826
Fittings.—Construction of fittings let out on hire during the year 1876	340,652	13,626
Meters.—Acquisition of meters let out on hire	338,567	13,543
Vehicles.—Increase of the number of horses and vehicles for the conveyance of coal, coke, ammoniacal liquor, tar, &c.	96,724	3,869
Plant and Tools.—General increase in stock	97,334	3,894
Establishment Charges.—Miscellaneous payments	190,578	7,623
Total	3,180,165	£127,207
Total expenses of first establishment	10,603,113	£424,124
From this must be deducted—		
Value of works superseded, to be replaced by others, necessitating the opening of fresh credits. . . . . 280,881 frs.		
Over-value realized on sale of the site of old La Tour, Tudaine, and Poissonnière works . . . 1,309,134 frs.		
	1,590,015	63,600
Total	9,013,098	£360,524

The general position of the account of first establishment charges may be thus stated:—

	Francs.	Sterling.
Amount expended to Dec. 31, 1875	153,011,292	£6,120,451
Ditto during 1876	9,013,098	360,524
Total on Dec. 31, 1876	162,024,390	£6,480,975
To meet which there is a capital of—		
In shares 84,000,000 frs.		
In bonds 85,145,739 frs.		
	169,145,739*	6,765,829
Balance in company's favour	7,121,349	£284,854

Property to be Realized.—We informed you last year that the sale of our surplus land, resulting from the superseding of the Trudaine, La Tour, and Poissonnière works had been concluded, and that we should very probably this year be in a position to give you a definite account of this long and laborious operation.

These properties, which formed part of the estate of the original companies, figured primarily in our assets for the sum of 5,793,450 frs. (£231,738). In order to supply the place of this capital provisionally sunk, we have had to increase our loans by an equivalent sum, the interest upon which has necessarily been a burden upon the undertaking, and you decided on several occasions that this interest should be refunded to the shareholders out of the balance arising from the sale of the property.

This reimbursement has already been effected to the extent of 2,667,106 frs. (£106,684) for all the property sold previously to Dec. 31, 1863. The undivided balance arising from property sold since that date (valued at 525,020 frs., or £21,000) amounts to the sum of 222,694 frs. (£8908), which has been carried to the credit of the liquidation account for the year 1875.

The balance upon the entire operation, after deducting the interest reimbursed, amounts to 1,309,134 frs. (£52,365), and that sum has been placed to the credit of the general fund, in conformity with your resolutions of March 21, 1863, March 21, 1864, and March 17, 1866.

Loan.—The loan of 25,226,080 frs. (£1,009,044), which you authorized us to contract in 1875, in order to liquidate the expenses of first establishment incurred up to Dec. 31, 1874, and to raise the annual manufacturing power of our works from 185 to 225 million cubic mètres (6530 to 8000 million cubic feet) has been affected, by works to be carried out during the year 1875 and following years, to the extent of 23,216,000 frs., apportioned as follows:—

	Francs.	Sterling.
Purchase of land and extension of works.	12,716,000	£508,640
Main-laying	3,260,000	130,400
House services, fittings, and meters on hire, tools, &c.	7,240,000	289,600
Total	23,216,000	£928,640

The amount expended out of this sum during the years 1875 and 1876 reached a total of 16,638,456 frs., apportioned as follows:—

	Francs.	Sterling.
Purchase of land and extension of works.	10,552,859	£422,114
Main-laying	2,437,098	97,484
House services, fittings, and meters on hire, tools, &c.	3,648,499	145,940
Total	16,638,456	£665,538

Consequently, on Dec. 31 last there remained to be expended—

	Francs.	Sterling.
On land and works	2,163,140	£86,526
On mains	822,902	32,916
On house services, &c.	3,591,501	143,660
Total	6,577,543	£263,102

The difference existing between the last figure and that of the available resources is explained by the fact that the balance from the liquidation of the expenses of first establishment on Dec. 31, 1874, combined with the balance realized by the sale of the properties previously referred to, has remained below our anticipations, and has given rise to a bonus of 543,805 frs. (£21,752).

As far as concerns the works to be executed for raising by 40 million cubic mètres (1412 million cubic feet) the productive power of our works, we hope to remain within the limits of our calculations, the expenses incurred up to Dec. 31 last being exactly in proportion to the increase in consumption of 28 million cubic mètres (988½ million cubic feet) realized during the last two years.

Although the amount of the expenses of first establishment incurred up to Dec. 31, 1876, exceeds that of our resources realized at the same date, we do not think it will be necessary to modify the conditions of payment of the current loan. We shall confine ourselves, as last year, to authorizing those subscribers who request it, to relieve themselves, from the 6th of April next, of the last instalment not due, on condition that they add to the amount of this instalment a sum equivalent to the interest they will thus receive in advance by means of the half-yearly coupons attached to the fully-paid scrip. This sum, which last year was 15 frs., will this year be reduced to 5 frs.

Working Account for the Year 1876.

Expenditure.

	Francs.	Sterling.
Value of gas in store on Jan. 1, 1876	10,757	£430
Materials used in Manufacture.		
Coals carbonized	17,894,059	£715,762
Coke and tar for heating purposes	3,302,396	132,096
	21,196,455	£847,858
Manufacturing Charges.		
Salaries and wages	2,190,709	£87,628
Maintenance of works and plant	1,323,712	52,949
Incidental expenses of distillation	1,031,934	41,277
Purifying material	260,347	10,414
General expenses	79,299	3,172
	4,886,001	£195,440
Cost of Distribution.		
Salaries of engineers and officers	917,216	£36,689
Repair and maintenance of mains and service-pipes	486,284	19,451
Allowances, premiums, &c.	5,934	237
Printing and advertising	131,219	5,249
Miscellaneous	48,464	1,938
	1,589,117	£63,564
General Management.		
Board of direction	80,000	£3,200
Executive committee	70,000	2,800
Salaries	701,749	28,070
Office and other expenses	121,106	4,844
Service, accidents, relief, &c.	118,791	4,751
Law and other charges	24,340	973
Rents and insurances	68,145	2,726
Interest on loans	4,272,560	170,902
Loan redemption-fund	1,046,500	41,860
Share ditto	1,200,250	48,010
Cost of experiments, &c.	10,313	412
Pension-fund	85,500	3,420
Provident-fund	101,187	4,048
	7,900,441	£316,016
Municipal Charges.		
Tax of ·02 c. per cubic mètre of gas	3,178,632	£127,145
Rating of subsoil	200,000	8,000
Lighting, extinguishing, and maintenance of public lamps	455,570	18,223
	3,834,202	£153,368
State Charges.		
Taxes	395,867	£15,835
Subsidy to Control Department	8,000	320
Stamps	109,491	4,379
	513,358	£20,534
Total Expenditure	39,930,332	£1,597,213

Revenue.

Produce of the sale of gas	46,284,121	£1,851,365
Value of gas in store on Jan. 1, 1876	26,642	1,066
Retort coke	14,999,028	599,961
Furnace coke	532,009	21,280
Tar	2,567,901	102,716
Ammoniacal liquor	306,008	12,240
Compressed fuel	11,475	459
Rent of meters on hire	932,406	37,296
Ditto of fittings, &c., ditto	919,396	36,776
Fire-bricks	251,177	10,047
Chemical products	930,008	37,200
Sundry works	100,617	4,025
Interests and discounts	627,132	25,085
Total Revenue	68,487,920	£2,739,516
Balance in favour of revenue, being profit made during 1876	28,557,588	£1,142,303
Add balance of profit from 1875	551,229	22,049
	29,108,817	£1,164,352
Deduct reserve to meet claims outstanding on Dec. 31, 1876	108,817	4,352
Balance, being profit available for distribution	29,000,000	£1,160,000
Deduct for share dividend	12,400,000	496,000
Balance divisible equally between the Municipality of Paris and the Gas Company	16,600,000	£664,000

The total amount available for distribution among the shareholders is, therefore, as follows:—

	Francs.	Sterling.
Dividend, as per above account	12,400,000	£496,000
Moiety of balance, ditto	8,300,000	332,000
Fourth payment by the city on account of loan.	50,000	2,000
Balance of profit from 1875	380,604	15,224
Total	21,130,604	£845,224
Deduct 1 fr. per share for special reserve-fund, authorized at the general meeting on March 23, 1875	336,000	13,440
Balance	20,794,604	£831,784
Deduct first dividend of 12 frs. 50 c. paid in October last	3,987,200	159,488
	16,807,404	£672,296
Deduct final dividend of 49 frs. 50 c., making a total dividend for the year of 62 frs. per share (250 frs.)	16,632,000	665,280
Net balance to carry forward	175,404	£7,016

Provident and other Funds.

Provident-Fund.—During the year 1876 the medical staff visited at their homes 1675 of the company's servants who were absent on account of sickness, and attended 22,375 consultations. The medical fees, medicine, baths and instruments, half salaries, and funeral expenses, caused an expenditure of 236,279 frs. (£9451). The account of this fund is as follows:—

Expenditure.

	Francs.	Sterling.
Medical fees, medicine, &c., as above	236,279	£9,451
Receipts.		
One per cent. deducted from salaries, &c.	101,187	£4,047
Equal amount given by the company	101,187	4,047
Interest and sundry receipts	8,776	352
Total	211,150	£8,446
Excess of expenditure	25,129	£1,005

* It follows from an examination of the balance-sheet that out of a capital of 169,145,739 frs. there had been paid off, on Dec. 31 last, in shares, 5,456,250 frs.; in bonds, 6,366,399 frs.; total, 11,822,649 frs.; leaving 157,323,090 frs. still to be redeemed.

This increase in expenditure results principally from the payment of half salaries to the workmen and other servants of the company who are unable to discharge their duties on account of sickness, the number of whom increased, as in the year 1875, in a very large proportion.

On the 31st of December last this fund possessed 157 of the company's fully-paid bonds; the company were, however, at the same time, indebted to the fund in a sum of 51,138 frs. (£2045), which reduced the balance to its credit to 28,670 frs. (£1147). At the corresponding date in 1875 this credit balance stood at 53,799 frs. (£2152).

Pension-Fund.—The amount placed to the credit of this fund since its formation, including interest and balance realized upon the last drawing of bonds, reached on Dec. 31 last a total of 1,336,431 frs., represented by—

	Francs.	Sterling.
Bonds partly paid up (3028)	1,213,315	£48,532
Balance in hand	123,116	4,925
Total	1,336,431	£53,457

The disposable balance, augmented by the grant made to the fund for the first half of the year 1877, will be employed in paying off the fourth instalment on 1190 bonds not fully paid up, and in the purchase of fresh securities. Supposing that these can be purchased at about par, it will be seen that the annual revenue of the pension-fund will, on the 1st of July next, amount to about 70,000 frs. (£2800), after deducting tax.

The deduction of 4500 frs. made each year from the amount placed to the credit of this fund, in conformity with the rule, for the purpose of assisting those of the company's servants who have become incapable of performing their duties, but who have no claim upon the fund, has not been sufficient. We have, therefore, subsidized it to the extent of 56,502 frs. (£2260), forming a total of 61,002 frs. (£2440), of which 15,800 frs. (£632) are for pensions, and 45,202 frs. (£1808) are for assistance, renewable every year. Last year this subsidy amounted to 49,654 frs. (£1986).

Special Reserve-Fund.—This fund, the formation of which was authorized by you in conformity with Article 40 of the statutes, was founded with the object of securing to the completed shares, at the end of the concession, a capital of equal value to the share which the City of Paris will then take of the company's assets. It is augmented every year by means of a levy to the extent of one franc per share upon the shareholders profits, and to this is added the interest on former levies. You further decided that the annuity of 210,296 frs. (£8412) due to the company by the City of Paris, in execution of Article 4 of the treaty of April 27, 1872, should be added to it. This annuity, the repayment of which is to be deferred till 1888, represented on Dec. 31 last a credit, in capital and interest, of 906,833 frs. (£36,273).

The position of this fund on Dec. 31 last may, therefore, be stated as follows:—

	Francs.	Sterling.
Amount paid into fund	1,008,000	£40,320
Interest	62,789	2,511
Deferred annuities of the City of Paris, capital and interest	906,833	36,273
Total	1,977,622	£79,104

The first two amounts are represented by 2715 of the company's bonds, paid up to the extent of 300 frs., and costing 691,857 frs. (£27,674), and by a balance in hand of 378,941 frs. (£15,157), which will be applied in paying off the fourth instalment upon these 2715 bonds, and in the acquisition of fresh securities.

In July next the special reserve-fund will be in possession of 2980 fully-paid bonds of 400 frs., producing, after deducting the tax of 3 per cent., an annual interest of 57,800 frs. (£2312).

Labour, Materials, Residuals, Etc.

Labour.—In 1876 the price of labour in Paris underwent a further advance, and, in order to retain our workpeople, we were obliged to raise the salaries of a certain number of them. But you are aware, gentlemen, that we do not confine ourselves to considering these augmentations of salaries as a necessity commanded by circumstances, but that we make it our duty to endeavour, at the same time, to give them a tendency to a useful and moral end. Thus we have successively added to the fixed salaries of our special workmen a variable sum proportionate to the amount of work performed, and a premium, called a "premium for punctuality," because it is awarded exclusively to those men who have not absented themselves without leave during the month.

Savings-Fund.—While ameliorating the material condition of our workmen, we proposed also to inspire in them habits of thriftiness, and to afford them facilities for putting away, without expense or loss of time, whatever money they might be able to save each month out of their earnings. We have thus been led to establish a savings-fund, the object of which is to render productive the smallest sums deposited in it. This fund has been in existence since the 1st of July last, and has worked with the greatest simplicity on the following conditions:—

The deposits are entered in a small book in the name of the depositor, and bear interest at the rate of 5 per cent. per annum. The interest is made up in periods of six months, no fractional parts of such periods being considered, and added to the capital previously deposited.

The sums deposited, whether at one time or successively, must not exceed 500 frs. When they reach that amount the company undertake to purchase, with the consent of the depositors, and without any expense to them, some of the following stock, the vouchers for which are at once transmitted to them:—French Three per Cents.; 3 per cent. Bonds of the Eastern, Northern, Western, Lyons, and Orleans Railways; or 5 per cent. Bonds of the Paris Gas Company.

All the company's servants, permanent or temporary, are admitted to a participation of the benefits of this institution, the operations of which may be summarized as follows:—

	Francs.	Sterling.
In the second half of 1876, 2392 accounts were opened, and there was received on deposit a total sum of	152,993	£6,119
Out of this sum there was repaid—		
In cash to 141 depositors leaving the company's service	7,679 frs.	
In vouchers to 41 depositors whose deposits exceeded 500 frs.	15,745 frs.	
	23,424	937
Balance in hand on Dec. 31, 1876	129,569	£5,182

This sum belongs to 2251 depositors, and represents an average deposit in the six months of 57frs. 56c. (£2 5s. 8d.), corresponding to about 6 per cent. on the salaries received.

The total amount of interest placed to the credit of the depositors accounts on Dec. 31 last reached the sum of 1780 frs. (£71), which was deducted from the sum realized by the investment of the deposited funds.

Coal.—Although the price of coal has lowered considerably since this time last year, our net price for 1876 was rather higher than that for 1875. The extent of our consumption does not allow us to purchase our coals as we require them; we are obliged to secure our supplies a long time in advance. If this obligation prevents us profiting afterwards by any lowering that may take place in price, it, at the same time, guarantees us against the vexatious results of a rise.

It is, in a great measure, to this circumstance that we are indebted for the progressive increase that has taken place during the past few years in our profits, even when the price of coal, which constitutes nearly half of our working expenses, had very nearly trebled.

For the rest, you will learn with satisfaction that we have lately renewed, on advantageous terms, several of our contracts, which would have expired either this year or in the course of the next.

Retort Coke.—The employment of retort coke for domestic purposes continues to become more general, in spite of the extent to which heating by gas is carried on.

At the commencement of the winter the sale considerably exceeded the production, and we should have been able easily to dispose of our summer stock of coke, if the mildness of the temperature had not caused a diminution in the demand.

Notwithstanding the unfavourable circumstances in which we were placed, our sales of retort coke produced 14,089,688 frs. (£563,587), differing by only 8746 frs. (£350) from the amount realized in 1875, which reached 14,098,434 frs. (£563,937).

With regard to the sale of metallurgic coke, it has only produced 585,624 frs. (£23,425), which is less by 93,188 frs. (£3727) than the total amount of the corresponding sales in the preceding year. Under the head of coke, therefore, the receipts have decreased by 101,934 frs. (£4077).

Heating Apparatus.—In the course of the year 1876 we sold 2301 apparatus for heating by coke, being 332 less than in 1875; this brings the number of apparatus sent out from our works up to 43,032, the whole of which are now, so to speak, in operation in Paris.

These apparatus, which are constructed with special care, are offered to the public at cost price, and have largely contributed to extend the use of coke for domestic purposes.

Tar and Chemical Products.—All the products resulting from the treatment of our tar and ammoniacal liquor are disposed of with great facility, and on advantageous terms. The net result of this manufacture in 1876 was as follows:—

	Francs.	Sterling.
Treatment of tar	2,567,901	£102,716
Treatment of ammoniacal liquor	930,008	37,200
Total	3,497,909	£139,916

Exceeding by 151,289 frs. (£6051) the corresponding amount in the preceding year.

Gas-Engines.—The use of these engines is extending slowly. Last year, however, we sold 14 horizontal engines on Lenoir's system, and 48 of Otto and Langen's vertical engines, representing altogether a motive power of 82 horses. These latter engines, which, unlike those on Lenoir's system, do not require the employment of electricity, and also occupy less space, seem destined to render real service in minor manufacturing operations. The number of gas-engines in use in Paris on Dec. 31 last was 234, and the quantity of gas consumed by them may be approximatively estimated at 800,000 cubic mètres (28¼ million cubic feet) annually.

Compressed Fuel.—During the year 1876 we manufactured 31,703 tons of compressed fuel, for the production of which 495,000 hectolitres (1,361,250 bushels) of coke dust were used. The employment of this combustible in our works enabled us to profitably offer for sale a nearly equal quantity of retort coke, instead of consuming it ourselves.

GAS AFFAIRS AT LIMERICK.

The First Report of the Commission appointed to inquire into the local government and taxation of towns in Ireland has just been presented to Parliament. The commission was appointed in August last on the recommendation of a select committee of the House of Commons, to inquire into the operation in Ireland of certain statutes relating to these subjects, applicable to that part of the kingdom, and to advise whether any and what alterations should be made in the law. The commissioners state that their inquiry in the four important municipal boroughs of Limerick, Cork, Waterford, and Belfast, which occupied much of their time, involved so many matters of interest as bearing on the administration of the trusts of the corporations, that they deemed it right to present a special report on each.

The question of the corporate management of the gas-works at Limerick, which works have been carried on in competition with the rival undertaking of the United General Gas Company, engaged much attention, and the commissioners, in their special report, make the following observations thereon.*

In the year 1856 the premises, machinery, plant, and stock-in-trade of the Limerick Gas Consumers Company were purchased by the corporation for the sum of £10,000, in the exercise of the powers conferred by the 62nd section of the Improvement Act of 1853. For this purpose debenture mortgages charged upon the improvement fund were, to the amount of £10,000, issued to the scrip holders of the Limerick Gas Company, in consideration of which the gas-works, machinery, and plant, were assigned to the corporation at the time of the purchase.

These works were, it was unanimously admitted, in a very defective state at that time, and they were graphically described by Mr. William Spaight as a "rickety, worn-out, and insolvent concern."

The working of this concern has hitherto proved unprofitable, and from time to time, between the years 1856 and 1868, advances were made by the corporation in aid of the works out of the funds produced by the improvement rate, amounting in the whole to £7331.

Besides these advances from the improvement fund, the corporation, acting as the Gas Committee, mortgaged the gas-works, premises, plant, and gas-rental, and also the improvement rate, to the National Bank for £5000, by two mortgages for £3000 and £2000, to secure their overdraft of that amount on the current account.

That overdraft has since been very considerably exceeded, and on the 31st day of December, 1875, (*vide* report of Mr. Spillane, dated March 2, 1876, Appendix No. 51), the overdraft of the corporation upon the National Bank on the gas-works account stood at £14,769 16s. 1d.

It appears, too, on the books of the corporation that on the 11th day of July, 1876, a resolution was passed in the council by a majority of eleven to four, there being only fifteen members present, to advance a further sum of £2130 out of the improvement fund to the gas-works.

At the close of our inquiry in Limerick, this resolution had, however, not been acted upon, and the overdraft at the National Bank had been reduced to £14,000. We have since been informed that on Oct. 17, 1876, £400 was, in pursuance of the resolution, paid out of the improvement rate into the account of the gas-works.

It is alleged by Mr. Spillane, the manager, and those members of the corporation who have supported the policy of thus subsidizing these works,

* A summary report of the evidence taken by the commissioners on the gas question appeared in the JOURNAL for Oct. 3, 1876, pp. 493-5.

that their value has been thereby so increased as to justify the outlay from a financial point of view, but the result is that the actual position of the Limerick Corporation Gas-Works is as follows:—The balance still due to the scrip holders of the original purchase-money is reduced to £7712; £2288 of that £10,000 having been paid off out of the improvement rate by the operation of the sinking-fund. The amount of advances made by the corporation out of the improvement fund is £7331 1s. 9d., and the amount due to the National Bank is £14,000, so that the total capital debt on account of the gas-works now stands at £29,043 1s. 9d., instead of at £7712 as at first represented to us.

The statement of the capital account upon the printed report of March 7, 1876, is misleading, as no reduction is there made from the original mortgage for £10,000 in respect of the payment of a bond for £2288, which reduced that charge on the improvement-fund to £7712.

The corporation, since the purchase of these gas-works, has manufactured gas for the public lighting of the borough, and for supplying private consumers. For the conduct of this business, there was up to June, 1875, a Gas Committee of the council, under whose directions the gas-works were carried on.

From 1868 to June, 1875, Mr. William Spillane was chairman of this Gas Committee, and at the latter date he was appointed manager of the gas-works, at a salary of £300 per year. Reports of the working of the gas business were from time to time submitted by the committee to the corporation, but these accounts appear to have been very superficially examined; and the reports of the committee were invariably adopted by the council *en bloc*, although there seems to have existed always some difference of opinion as to the prudence of the corporation retaining the ownership and management of the works.

Besides the interest accruing on these large advances to the gas-works already adverted to, the ratepayers are each year charged with the annual expense of lighting the public lamps, for which, by a resolution of the council dated Dec. 5, 1872, they have been charged from Jan. 1, 1873, to the present time £5 per lamp, £1 per lamp having been added to the original charge of £4 in 1873 on account of the increased price of coals, which, notwithstanding the subsequent reduction in price, has not yet been taken off.

From June, 1874, to June, 1875, the charge to the improvement fund for lighting the town was £1748 1s. 10d. From the time of the purchase of the gas-works by the corporation in 1856 to the end of June, 1875, the total charge for lighting the town has been £33,578 11s. 10d. This has been always paid out of the improvement rate, and in no single year has anything been placed to the credit of the fund in respect of the receipts from the supply of gas to general consumers.

From time to time efforts have been made by some members of the corporation to have the accounts of the gas management more closely investigated, but without effect; and similar efforts to defer the votes for advances in aid of the gas capital account out of the improvement fund until the opinion of the citizens could be taken thereon, were likewise overruled or frustrated.

Other attempts by members of the council to have the system of management changed also failed. On June 5, 1875, Mr. John Somerville, a gas engineer, submitted a tender for undertaking the management of the gas-works, and supplying lights to the borough (see Appendix No. 50). Mr. Somerville, it will be thereby seen, offered to become sole manager and engineer of the Limerick Corporation Gas-Works, his remuneration to be one-half of the net profits of the concern after deducting all expenses of maintaining the works, and the profits not to be calculated till this had been done, with a provision for ascertaining the same by arbitration. He also bound himself to light the public lamps at £4 each, and to submit the accounts annually to the Government auditor.

The acceptance of this offer, assuming that it would be fairly carried out, would apparently have resulted in the saving of about £400 per year in the cost of public lighting alone, as there are about 400 public lamps; but notwithstanding this, Mr. Somerville's offer was practically, though not in terms, rejected on June 24, 1875, by a resolution of the council "that we are determined to retain our gas-works, and that Mr. William Spillane be requested by the council to accept the office of sole director of the works, and in the event of his doing so, that he be paid a salary of £300 per annum."

At this meeting only 16 members out of the 40 constituting the town council were present.

Mr. Spillane resigned his seat as a member of the council, and paid the nominal fine of 6d., in order that he might be able to accept the office of manager at the salary named in the resolution, which position he has since held.

No notice of the motion, nor of any resolution to appoint a salaried manager, was given to the members of the council. The matter, therefore, did not receive full or fair consideration or discussion, and the result is that in addition to the former liabilities and responsibilities in respect of the gas-works, the corporation have to pay a salary of £300 per year to a paid manager.

Mr. Spillane is a man of ability and energy, but he is not a gas engineer, and his only experience in the manufacture of gas has been in connexion with these works.

Mr. Spillane laid before us a statement of the gas accounts for the half year, ending June 30, 1876 (Appendix No. 54), in which, after charging the corporation with £986 7s. 6d., for public lighting for the half year, he shows a profit on the half year's working of £507 11s. 10½d.; but this charge for public lighting is above the rate charged for gas to private consumers, and the effect of this is to increase the apparent profits of the gas-works at the expense of the improvement fund.

The accounts of the gas business, although a portion of the public property, have never been submitted to audit, for which a special provision will be found in Mr. Somerville's tender.

Appendix No. 50.

Offices, 20, Westland Row, Dublin, June 5, 1875.

To the Right Worshipful the Mayor, Burgesses, and Corporation of the City of Limerick.

I propose to become the engineer and general manager of the Limerick Corporation Gas-Works on the following terms, and subject to the conditions hereinafter contained:—

1. The remuneration for my services to be one-half of the net profits of the working of the concern, after payment, out of such profits, of interest on such portions of the existing liabilities of the undertaking (upon which interest is at present payable by the Gas Committee) as shall from time to time be due.

2. Deductions for depreciations and rates and taxes, as stated in the accounts of the Gas Committee, to be also made before computing net profits.

3. Premises to be insured for not less than £3000, the premium to be also deducted from the profits.

4. The works, mains, &c., to be maintained out of profits in a state of thorough efficiency.

5. I am to have the whole management and control of the works, workmen, &c., and subject to the inspection of a person to be from time to time appointed by the corporation, and who should have access to the works at any time without previous notice.

6. The accounts to be submitted for audit to the Government auditor, should the corporation so require.

7. The gas to be supplied to be of the quality that 5 cubic feet per hour shall be equal to 14 standard candles, to be tested in the town-hall, and the price to be charged to be according to the scale proposed by the Gas Committee.

8. The contract for the lighting of the public lamps to be given to the concern. The lamps to be supplied with 5 cubic feet per hour during the prescribed hours for lighting, and to be paid for by the corporation at the rate of £4 per lamp per annum; the payment to be made by the corporation quarterly as at present, after deducting quarterly proportions of interest due on the debts. The lighting to be subject to the conditions at present existing.

9. The price per lamp to be increased according to the scale for private consumers, or at the rate of 1s. 4d. per lamp for each 1s. per ton that the price of coal shall exceed 30s. The standard price of coal to be taken at the average price of first-class gas coals in Newcastle district, with all charges and freights added.

10. This agreement to be continued upon the aforesaid terms as long as a reasonable profit shall be made for the corporation, the reasonableness of such profit to be ascertained by arbitration in the manner prescribed by the Companies Clauses Consolidation Act, 1845, or the Gas-Works Clauses Act, all the circumstances of the case being taken into consideration. The expense of such arbitration to be paid out of profits.

11. The agreement is to terminate if arbitrators find that reasonable profit is not being made.

12. If the corporation extend their works, or erect, or carry out new works, or become sole manufacturers of gas in Limerick, this agreement to extend to such extension of capital and premises, together with the working thereof, as long as the corporation are manufacturers of gas in Limerick.

13. The proportion of net profits payable yearly to the corporation is upon payment to be applied towards paying off the debts of the gas concern, or in the promotion of a sinking-fund for that purpose.

14. This agreement to be determined on my side by giving six months notice previous to a gas gale day.

15. All moneys required for extension or permanent improvements (as approved of by the corporation officers) to be provided by the corporation, who are to be the owners of such extension or improvements; interest on such outlay and the usual depreciation being deducted out of profits.

16. All moneys required for floating or working capital to be provided between myself and the corporation equally.

17. This agreement to commence from the 1st of July next.

(Signed) JOHN SOMERVILLE.

Appendix No. 51.

LIMERICK CORPORATION GAS-WORKS—HALF-YEARLY REPORT.

Corporation Gas Office, 34, William Street, March 2, 1876.

To the Mayor, Aldermen, and Burgesses of the City of Limerick.

Gentlemen,—While I submit for your information my first half-yearly balance-sheet, I venture to direct your attention to the circumstances which led to the purchase and maintenance, by the corporation, of the gas-works at Watergate. Previous to 1841 the United General or English Company was the sole manufacturer of gas in Limerick. Many amongst you remember how you feared in those days, but those who do not will best understand *now* the condition of things under that *régime*, from the following resolution passed unanimously at a public meeting called at the request of, and attended by, the leading citizens of Limerick. The meeting was held in the City Court House in the year 1837, and the Mayor, Edmond Morony, was chairman; resolved—"That the gas supplied for lighting this city is impure and bad, and the price charged most extravagant and unreasonable; it, therefore, appears very desirable that a local company should be formed for supplying the citizens with cheap and good light, thereby keeping the profits at home amongst themselves." The following committee was appointed to carry the foregoing resolution, amongst others, into effect:—Francis Spaight, John Westropp, Michael Quinn, James Morris, John Rochford, John Stevenson, J. N. Russell, J. Alton, C. O'Brien, J. M. Usborne, James Morgan, Samuel Dickson, J. Boyse, W. H. Hall, and R. M'Mahon. The following was the scale of charges enforced with the utmost rigour by the English company:—For each burner to nine p.m., £3 8s. per annum; to ten p.m., £4 1s.; to eleven p.m., £4 15s.; to twelve p.m., £5 8s. 6d.; or, if they consented to give a meter, 15s. per 1000 cubic feet. Intolerance and extortion had gone too far—public spirit was aroused, and the Citizens Company was established in Watergate in 1841. This local institution, formed at the urgent request of the people of the city, in order to relieve them from what they had been suffering for many years at the hands of the English company, was but poorly supported, and in 1856, having struggled against fearful odds for 15 years, it got into pecuniary difficulties, and was obliged to give way, consoled by the reflection that it had very materially improved the quality of the gas, and had brought down the price from 15s. per 1000 to 5s. 6d. The English company now seeing the crisis, and anxious, no doubt, to recoup itself for what it had been despoiled of since 1841, made every effort to again get sole possession of our city, but the corporation having a very lively recollection of what that meant, and judging the future by the past, interposed in the interests of the people, and made an offer of £10,000 for the works. The shareholders, being themselves Limerick men, understanding and dreading the danger in the future, refused a much larger offer from the United General Company, and handed over the works to the corporation. Thus it was that the council, with the full approbation of their constituents, was forced into the undertaking, not so much with the hope of making profit as to save the people from what they had all suffered up to 1841. No sane man can assert that, in purchasing the gas-works under those circumstances, the corporation outstepped its legitimate province, and if, as yet, the investment has not proved as profitable as it might, perhaps the people themselves are not altogether free from blame. Let those citizens who have, up to the present hour, refused to support it, ask themselves have they done their duty by their own. Now, looking at the purchase from a purely financial point of view, what have been the results after 20 years? One is tired of hearing from persons who either have never considered, or who, if they have, do not properly understand the question, what a heavy drag-chain the gas-works have been on the necks of the people! Let us examine calmly what grounds exist for this complaint. The purchase-money, which has not been paid, was fixed at £10,000. The corporation only undertook to pay interest on the sum at 5 per cent., or £500 a year. This interest has been for 20 years punctually paid by the Gas Committee, and not one single penny on this head has been paid, up to 1875, by the citizens. Since 1856 (the year of purchase), the various grants made by the council for the extension of the concern amount to £7331 1s. 9d. In addition to this sum levied from the rates, the council has paid for the redemption of some of the original bonds (part of the £10,000) £2280, thus making a total of £9619 paid by the people in aid of the works. Out of this sum £1800 was refunded by the Gas Committee,

thus leaving the net amount expended by the corporation £7819 in 20 years, or £391 per annum. So far we have been contemplating our losses by the purchase. Let us now see what have been our gains. If we take the gas-rental of the whole city at £10,000 per annum—a sum considerably under the actual amount—when gas is sold at 5s., this sum would be £20,000 a year if the price charged were 10s., which the English company admit was their price, and it would amount to £30,000 were the price charged 15s. per 1000 feet, which latter price was the minimum charged by them, as documents in my possession will prove. It does not require much arithmetical calculation to ascertain what £20,000, or as the English will have it, £10,000 a year saved, would produce in 20 years. This product, £200,000 at the very lowest estimate, has been saved the gas consumers of this city by the so-called "drag-chain," and if all do not appreciate the boon thus conferred, surely it is not too much to ask the charity of their silence. The supporters of the alien establishment here have, as far as I know, but one argument in vindication of their policy, if it can be called such. They say, and the officials of that company having first prompted them, lustily join the chorus, if we do not keep the two companies working we will be subjected to the same treatment we experienced at the hands of the English prior to your opposition. 'Tis well the English admit their intolerance; their motive now is too transparent to need comment. If the two were joint-stock companies, we could all see the force of the argument; but when one of the two is the property of every ratepayer in this city, the argument advanced is a delusion. Every one competent to form an opinion on this subject knows that Limerick cannot support two rival gas companies without loss to either or both. One of the two must inevitably give way. Which do the people wish to maintain, the English or their own? This is the simple question every man in this city has to ask and answer himself. We all know, some by bitter experience, others by tradition, what the aliens were when monopolists. Would the corporation be equally intolerant in their treatment of the people, and exorbitant in their prices? Further, would they advance the prices at all? The forty members would be all consumers of gas; hence, they would supply it as cheaply as possible. The price for the council would be the price for the city, then cheap gas would be the order of the day. Again, unlike a joint-stock company, the corporation could not divide the dividends out of their profits among themselves; hence there could be no motive for the price being high. It is absurd to suppose that, in order to reduce taxation by large profits (for this could be the only motive), the council would advance the price, thereby causing the citizens to use oil or candles instead of gas, and thus destroy their income, and all to what end? Simply to take a large sum of money out of one pocket and put a small portion of it into the other. And, lastly, though by no means the least, public opinion would be too strong to permit such a disastrous line of conduct being adopted; the property would be the citizens'; and they would insist on its being properly managed, due regard being had to their interests. The Irish have ever been able to hold their own even against the English, and let us hope that in Limerick they will not permit themselves to be driven from their own house, after a bitter struggle which has lasted for 20 years. I have now truthfully, and I hope plainly and intelligibly, stated my case on behalf of the Citizens Gas-Works. Let the people themselves now say, through their representatives, what side they will take in the future struggle, for struggle it must continue to be, until one succumbs. Will they flock to the English standard, or will they rally around their own? I feel an apology is necessary for the length of this report—let the importance of the subject matter under your consideration be my excuse. A glance at the balance-sheet, appended hereto, will show what have been the results of the concerns for the half year ending Dec. 31. The net profit which, were you a joint-stock company, would be available for dividend is £912 5s. 9d. This sum would be much larger were it not for several heavy payments under the headings renewals and charges. A new crown for one of the gasholders cost £100. Auditors fees for examining books and accounts to July 1, 1875, were £25. A completely new set of books, recommended by auditor, £14. A new fireproof safe, for books, papers, and cash, £20. These are all exceptional charges, and will not occur again for many years. The works are now, for the first time, insured for their value in six respectable offices, and this has entailed an outlay of £39. Since the 1st of July last, 79 new accounts have been opened in our ledger, and 19 good ones were refused, merely through inability to supply any more gas, owing altogether to deficiency of storeage, mains, and governors. During the past three months the machinery and plant have been taxed to the utmost limits of their power, and frequently beyond what was safe; and an increase of business, or even a satisfactory or sufficient supply of gas to those customers we have, with the present extent of our plant, cannot and must not be hoped for. Having learned, by experience, the defects of the concern, I invited the head engineer of the Dublin Gas Company to visit and report on your works. He has done so, and I now submit his elaborate report for your information.

(Signed) WILLIAM SPILLANE, Manager.

APPENDIX No. 54.

Dr. Revenue Account, for the Half Year ending June 30, 1876. Cr.

Coals carried forward	£2,241	11	9	Private lighting this half year	£2,564	9	2
Wages	613	7	2	Public lighting for corporation	986	7	6
Lime	14	5	3	Harbour Board	58	11	6
Salaries	295	3	9	Coke, tar, and residuals	1,051	0	9
Renewals and repairs	149	12	1				
Charges account	168	7	4½				
Public lamps, lighting, and repairing	158	13	9				
Rent and taxes	47	19	5				
Discounts and allowances	88	0	6				
Bad debts	25	0	0				
Plant depreciation	194	2	2				
Meter ditto	156	13	10				
Profit and loss	507	11	10½				
	£4,660	8	11		£4,660	8	11

Profit and Loss Account.

National Bank for interest	£339	13	6	Revenue account, half year's profit	£507	11	10½
Balance	167	18	4½				
	£507	11	10½		£507	11	10½

Balance Account.

Plant expenditure	£21,723	1	1	Capital account	£17,331	1	9
Meters ditto	3,202	0	5	National Bank	14,000	3	11
Gas-rents	1,930	9	6	Liabilities	1,475	16	5
Coke accounts due	172	7	2	Deposits by consumers	7	5	0
Fittings ditto	312	1	11				
Ditto in stock	146	4	6				
Coals ditto	734	5	10				
Retorts, bricks, and clay	250	0	0				
Cash on hand	31	18	1½				
Profit and loss	4,311	18	6½				
	£32,814	7	1		£32,814	7	1

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The declaration of war by Russia has not, so far, had much effect on the iron and steel trades, which were previously so greatly depressed that it would have been almost impossible for them to have become materially worse. On the other hand, however, the crisis has not brought the promise of any special amendment, although it has hitherto almost invariably happened that Sheffield has been the first and often the only town to feel the benefit of a great European war. In the armour-plate departments, for instance, the amount of work in hand is not very large, nor is it likely to become so in the face of the adoption of Creusot steel armour by the Italian Government for their two new vessels, *Il Dandolo* and *Il Duilio*. The slackness of the forges here has the natural tendency of keeping forge pig quiet, whilst those foundries which are at present doing any appreciable amount of work produce their own pig. Despite this fact, many of the blast furnaces near the town and throughout both counties are out of blast, and likely to remain so unless trade should take a turn, which is at present altogether unexpected and improbable. In the coal trade the situation is just now rather peculiar, so far as the export branch is concerned, and in some respects appears likely to be benefited. The Baltic is open as far as Perm, and will doubtless be free throughout in the course of a week or so, hence that class of shipments may begin in the ordinary way. This branch of business may improve for a time, whilst stores at depôts are being replenished, but it is extremely doubtful whether any permanent good will result. The Mediterranean trade, of course, also furnishes extra orders, but the bulk of these will doubtless go, as they have mostly done aforetime under similar circumstances, to South Wales. House coal is moderately good for the season, owing to the cold weather. Best house qualities are 15s. to 17s.; good, 13s. to 14s.; reliable, 11s. to 13s.; seconds, 11s. to 12s.; various classes down to slack, 10s. to 4s. per ton. Locomotive coal is 7s. to 9s. 6d.; ordinary steam, 9s. to 10s.; and gas, 8s. to 10s. per ton at the pits.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

In some quarters there is a little giving way in the value of round coal, but no general reduction in prices has as yet been announced, and the demand for this class of fuel remains much the same as last reported, some of the pits being still fairly busy. For some classes of common coal there is more demand from brickmakers, but generally this class of fuel continues a drug, and for sales in bulk very low prices are being taken. Good burgy meets with a fair demand, but the common sorts are plentiful. Slack generally continues scarce, with a stiffness in prices. The average pit quotations remain at 9s. 6d. to 10s. 6d. per ton for good Arley; 8s. 6d. to 9s. for Pemberton four-feet; 6s. 6d. to 7s. 6d. for common coal; 5s. to 5s. 6d. for burgy, and 3s. 9d. to 4s. 9d. per ton for slack.

In the West Lancashire districts a reduction of 10 per cent. in miners wages, to come into force on the 17th of May, has been decided upon. The men, who have resolved to carry the eight hours system of work into effect on the 1st of May, are, however, likely to meet the proposed reduction with opposition, and a meeting, to be held in Manchester, has been called for next week to consider the matter.

In the iron trade everything continues in a very stagnant condition, and very few orders, either for raw or manufactured iron, are at present being given out. The local makers of pig iron are doing little or nothing, and although more than half the furnaces are out of blast, stocks are going down. Prices remain without change, as makers will not come any lower; and for delivery into the Manchester district they are still asking 56s. to 57s. per ton for No. 3 foundry, and 54s. to 55s. per ton for No. 4 forge, less 2½ per cent. Middlesbrough iron delivered here is quoted at 50s. 9d. for No. 3 foundry, and 49s. 9d. for No. 4 forge, net cash. For the few finished iron orders that are being given out there is so much competition that prices are kept very low, and it is difficult to obtain more than £6 15s. per ton for bars delivered into the Manchester district.

Some of the late partners in the Darwen Iron Company are making an effort to start the works again; but whether they will succeed in the present depressed state of trade is doubtful.

THE COAL AND GENERAL TRADE OF THE NORTH.

(FROM OUR OWN CORRESPONDENT.)

The excitement with regard to the war between Russia and Turkey was as great as ever upon Newcastle Quayside, and in the North of England generally, last week. Steam shipping freights to the Mediterranean advanced about £4 per keel. There was a further rise to the Baltic. Coasting freights were also stiffer. But notwithstanding the fact that there is likely to be very considerable movements of the fleets of the belligerents, and of England and the European Powers generally, there was no improvement to note in the price of steam coal. This is not a little remarkable. It was fully anticipated that as steam coal may be calculated amongst war material, and as everything of that kind was running up very fast in the market, it would partake of the same upward tendency. But all that can be noted about it is that it is firmer—that the official rate of 12s. 6d. per ton, less 2½ per cent. discount, is more readily obtainable for best qualities. The change is very little, however. Second-class steam is in moderate demand. The shipments of Durham gas coal are seasonable. With May, the Baltic may be considered fully open to trade. This has caused an inquiry for gas coals. The prices are, off and on, what they have been during the spring. A very fair trade is doing from the Tyne Dock. The shipments at that place average 31,000 chaldrons per week, which may be considered tolerably heavy. More than one-half of the shipments are gas coals. Second-class gas coals find a market, but prices are low. House coals, on account of the weather having been cold so long, maintain their price.

During last week very heavy fleets of coal-laden vessels sailed from the Tyne. They were the largest we have had this spring, and the vessels were bound to all parts of the world. A number of coalsters have proceeded to sea. Coasting freights are a little better, but shippers have no reason for anxiety lest the war should force them up very much. The tonnage at the disposal of this trade is ample, and at the very highest there could not be more than a difference of from 3d. to 6d. per ton upon freights.

The general business of the North of England continues to be materially affected by the war. There is little inquiry for any kind of manufacturing goods. Iron is low in the market, and the chemical trade has not been so depressed for a long time. The shipments of fire-bricks and fire-clay goods are for immediate use and for repairs. There is nothing beyond that.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Fifth Anniversary Meeting of the West of Scotland Association of Gas Managers, which was held in Linlithgow on Thursday last, under the presidency of Mr. Levi Monk, of Lanark, was a very great success, alike as to the attendance of members and the interest of the proceedings. In due course, readers of the JOURNAL will have an opportunity of perusing the official report of the proceedings, and, therefore, it is not necessary that I

should say much on this occasion. Eleven new ordinary members were elected, including Mr. Alexander Bell, of Gibraltar, who was present at the meeting; and four honorary members were elected, one of whom was Mr. Henry Aitken, joint patentee with Mr. William Young of the process of enriching gas by means of the hydrocarbons which, practically, are suspended permanently in it. The leading features of the meeting were the presentation and discussion, and the sub-committee's report upon that process; and Mr. Peebles experimentally illustrated paper upon "The application of Electricity to Peebles's System of controlling the Action of Gas-Governors, and its adaptation for giving Flash Signals for Lighthouses, for Railway Signals," &c. With reference to the first-named subject, I may mention that the report contained a very elaborate summary of the results obtained by the sub-committee at the Hamilton Gas-Works, where the process has now been in actual operation for upwards of sixteen months. Representatives of the sub-committee were present at Hamilton on at least three occasions, superintending the experiments over a considerable length of time. The paper and experiments by Mr. Peebles excited a great amount of interest. In a discussion which afterwards took place on "20-candle Gas as a National Standard," some pertinent remarks were made by Mr. Samuel Stewart, Greenock; and eventually the president stated that, in the light of the results obtained in the experiments at Hamilton, his opinions on the subject had undergone a complete change, and he unhesitatingly withdrew all that he had said upon it at the half-yearly meeting held in Glasgow last October. In succession to Mr. Monk, as president, Mr. James M'Gilchrist, Dumbarton, was elected to that office; and Mr. Carlow, Port Glasgow, was elected secretary, in succession to Mr. M'Gilchrist. Before separating, it was resolved that the next half-yearly meeting of the Association should be held at Helensburgh. Most of the members visited the magnificent ruins of Linlithgow Palace, and subsequently there was a dinner held in the "Star and Garter" Hotel, the chairman being the new president, the vice-chairs being worthily occupied by Mr. Monk and Mr. Blaikie, of Messrs. Milne and Sons, Edinburgh. Some members stayed at Linlithgow over the night, and had a pic-nic in the grounds of Hopetown House on the following day.

I understand that Dr. Wallace, Gas Examiner for the city of Glasgow, has, during the last few weeks, visited Hamilton Gas-Works some eight or ten times, for the purpose of instituting a very complete examination of the Aitken and Young process of gas manufacture, and that he has employed a variety of cannel coals and bituminous shales, so as to enable him to say with confidence what sort of results the process shows under the varying circumstances in which it may be employed in actual practice. His official report is not yet in shape, but it is satisfactory to know that he does not hesitate to pronounce the process to be a very decided step in advance in the science and art of gas-making.

The Perth Water Bill having obtained the sanction of the House of Commons Select Committee last Tuesday, many of the inhabitants received the news with great rejoicing.

On Wednesday last, the Forfar local authority lodged their proposed water scheme with the Court of Session, in compliance with the order pronounced by the First Division of the Court. The Bill will be promoted in Parliament next session.

The Water Commissioners of Dundee have requested their engineer to draw up a report on the proposed supply of Lintrathen water to Newport on two views—first, for the delivery of the water at the north end of the Tay Bridge; and second, to deliver it to the inhabitants of Newport on the principle of a domestic water-rate.

There has been some fluctuation in the price of pig iron during the past week; but generally the market has been firm. The market closed on Friday with sellers at 55s., and buyers offering 54s. 11d. cash.

The coal trade continues quiet. Prices are steady, but there is rather a dull look-out as to business during the next few months.

Map of the Metropolitan Gas Districts.—A coloured map of London, showing the boundaries of the Metropolitan Gas Companies since the amalgamations of last year, has been prepared by Mr. Preston Davies, of No. 6, Victoria Street, Westminster. Mr. Davies has had much experience in works of this description, and, possessing unusual opportunities for securing accuracy of detail in reference to the limits of the several London companies, he has supplied a map which may be implicitly relied upon, and which is drawn upon a scale which renders it very suitable for office purposes.

Swindon Water-Works Company.—The directors and shareholders of this company have just presented to Mr. P. H. Mason, their chairman, handsome testimonials of their esteem and appreciation of the valuable services rendered by him to them during the 12 years of the company's existence. The present from the directors consisted of a drawing-room timepiece, and that from the shareholders of a massive silver salver, and a gold chronometer with chain, seal, &c. The presentations were made at a complimentary dinner to Mr. Mason, when appropriate speeches were delivered.

Theft of Gas at Peterhead.—At the Peterhead Police Court last Tuesday week, Bailies Will and Macintosh on the bench, John Milne, shoemaker, was charged with fraudulently consuming gas, quantity unknown, between the 1st and 8th of April last, in the premises occupied by him in Longate. He pleaded not guilty, and was defended by Mr. Fletcher. From the evidence, it appeared that Milne, being in arrears with his account, had his meter removed on the 2nd of April, but on one of the servants of the gas company going to his premises on the evening of the Sunday succeding, it was found that a connexion had been formed by Milne, and that the gas was burning as brightly as when he had a meter. The Bailies found the charged proved and imposed a fine of 40s., or 20 days in gaol. The fine was paid.

Smashing a Street-Lamp.—At the Chesterfield Borough Police Court, on the 19th ult., Patrick O'Brien, a tramp, was brought up in custody, charged with smashing a street-lamp and doing damage to the amount of 5s. It appeared that because the prisoner was refused a ticket for the union, in consequence of his violent conduct, he took up a stone and threw it through the glass of one of the street-lamps near the police-station. Mr. Jones, the manager of the gas company, stated that they had had no less than 51 lamps broken in about four months. The Bench sentenced the prisoner to one month's hard labour in default of paying a fine of 10s., in addition to the damage and costs.

Sales of Gas and Water Shares.—At the Auction Mart, London, on Thursday last, Messrs. Ventum, Bull, and Cooper sold £500 ordinary A stock in The Gaslight and Coke Company, in five lots, the price realized being £215 per £100. A further lot of £90 stock in the same company realized £192 10s., and a third lot, of £80, realized £172 5s., these prices being all in advance of the market quotation of the previous day. At the same time and place twenty £10 shares, fully paid up, in the Colne Valley Water Company were sold at par, and £1566 ordinary stock in the Chelsea Water-Works Company realized prices ranging from £147 to £153 per £100. On the 10th ult., forty £10 shares in the York New Water-Works Company were sold by auction. They were offered in lots of five, with the option of taking 5, 10, or 15. Ten shares were sold for £20 5s. each, and the remainder at £20 2s. 6d. a share.

Odessa Water-Works Company, Limited.—The half-yearly report of this company states that the receipts amounted to £44,763, and the expenditure to £25,953, leaving a balance of £18,810. The interest charges for the year, amounting to £8873, reduce the above balance to £9936, out of which it is proposed to carry the sum of £855 in liquidation of the 1874 revenue suspense account, leaving a sum of £9081 available for distribution. In recommending a dividend at the rate of 1½ per cent. on the A shares, the directors declare the present inability of the company to provide cash to pay off the deferred dividend warrants issued last year, or those which have now again to be distributed, and they state that "the board have been earnestly trying to obtain from the Russian authorities some fulfilment of the hopes and promises referred to at the last November meeting; but the directors are obliged to report that, while excellent water continues to be abundantly supplied to the Imperial troops, as well as to the inhabitants of Odessa and its suburbs, the company to whom they are indebted for this blessing have obtained no recognition whatever of their claims. It remains a standing reproach to the people it benefits, who continue their efforts to increase its liabilities and difficulties. The directors must repeat that the city of Odessa does not use half the quantity of water required for the purposes of health and ordinary cleanliness. It neither flushes its drains nor has an outlet for its solid sewage, which should employ an amount of water that formed a main feature in the estimate of revenue relied upon for the legitimate success of the enterprise. Half the water which is brought into Odessa, under the requirements of the concession, is not, in consequence, paid for at all, while the price of what the inhabitants do take is extremely difficult to collect."

Proposed Testimonial to Mr. W. F. Cotton.—The *Freeman's Journal* says: "We learn that a movement is on foot amongst the shareholders of the Alliance Gas Company to present a testimonial to Mr. W. F. Cotton, the secretary and manager of the company. Never was a presentation of the kind better deserved, and we trust it will be one worthy the occasion. It is no exaggeration to say that the company owes its present unprecedented prosperity to Mr. Cotton. When he first interested himself in it, the company was in a wretched condition. He it was who worked up the facts on which the corporation based its case for the purchase of the concern. Had his advice been followed, the citizens would have now been in possession of a splendid property, yielding in relief of taxation a revenue of £25,000 or £30,000 per year. This project, however, fell through, and the gas company were then wise and fortunate enough to secure his services. He reorganized the concern, he effected enormous savings in the manufacture and general management, he converted a semi-bankrupt company into one of the most prosperous in the kingdom—paying the maximum dividend of 10 per cent., and with a moral certainty of continuing to pay it. The shares, which were worth £9 or £10, are now worth £18 or £19, and will be worth £20 or £21. All this is due to Mr. Cotton. The directors, no doubt, are able, painstaking men, but they would be, and have been, the first to recognize the debt they owe their manager and secretary, and would be the first to acknowledge that he is the real animating spirit of the concern. The shareholders, no doubt, will gladly avail themselves of the opportunity of evincing their recognition of his services, the more especially as they cannot but feel assured that a graceful compliment of this kind is certain to stimulate Mr. Cotton to, if possible, greater exertions in the future."

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

1542.—Hislop, G. R., Renfrew, N.B., "A new or improved mode of and means and chambers for calcining or revivifying spent lime." April 20, 1877.

1547.—Janig, H., Sherwood, Nottingham, "Improvements in machinery for cooling liquids, vapours, and gases, and for condensing steam and vapours." April 20, 1877.

1549.—Atkins, F. H., Fleet Street, London, "Improvements in filters." April 20, 1877.

1564.—Bradshaw, A., Accrington, Lancs, "Improvements in the construction of pressure-gauges." April 21, 1877.

1587.—Kidd, J. and J., Wandsworth, London. "Improvements in carburetting gas and air." April 24, 1877.

1592.—Newton, J., Longport, Stafford, "Improvements in apparatus for regulating the supply of gas to gas-burners for street lamps and other purposes." April 24, 1877.

1608.—Sallien, L., Brussels, "An improved apparatus for filtering liquids, applicable also to other similar purposes." April 25, 1877.

1611.—Dalziel, S., Kilmarnock, N.B., "Improvements in gas-meters." April 25, 1877.

1619.—Synge, M. H., Pall Mall, London, "Improved apparatus for filtering and purifying sewage." April 25, 1877.

1626.—Peebles, D. B., Edinburgh, "Improvements in apparatus for governing or otherwise acting on the flow or pressure of illuminating and other gases or vapours, and in part relating to the testing of gas and gas apparatus." April 26, 1877.

1632.—Weatherhogg, G. W., Camberwell, London, "Improvements in apparatus for carburetting atmospheric air." April 26, 1877.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

3763.—Blundell, G. T. and J. W., Limehouse, and Holmes, F., Victoria Park, London, "Improvements in pumps." Sept. 27, 1876.

3939.—Barnes, J., Accrington, Lancs, "Improvements in water or other fluid meters or motors." Oct. 12, 1876.

4109.—Walker, J., Glasgow, "An improved fluid meter." Oct. 24, 1876.

4203.—Watson, J., Seaham, Durham, "Improvements in the treatment and utilization of sewage." Oct. 30, 1876.

4207.—Johnson, J. H., Lincoln's Inn Fields, London, "Improvements in glass-gauges." A communication. Oct. 31, 1876.

4283.—Gent, J. S., Salford, Lancs, "Improvements in apparatus employed in the manufacture of gas-burners." Nov. 6, 1876.

4379.—Othon, L. P., Westminster, "Improvements in pumps." Nov. 11, 1876.

4392.—Watson, J., Greenwich, "Improvements in pumps." Nov. 13, 1876.

130.—Breeden, J., Birmingham, "Improvements in valves and taps or stop-cocks, and in hose unions." Jan. 10, 1877.

657.—Green, C. H., Old Broad Street, London, "Improvements in the arrangement and construction of gas-stoves and utensils to be used therewith, and for other purposes." A communication. Feb. 17, 1877.

706.—Jackson, W. M., Rhode Island, U.S.A., "Improvements in gas-stoves." Feb. 21, 1877.

NOTICE OF APPLICATION FOR LEAVE TO FILE A DISCLAIMER AND MEMORANDUM OF ALTERATION.

831.—Sugg, W. T., Westminster, "Improvements in gas-burners and in the method of constructing and manufacturing the same." March 18, 1869.

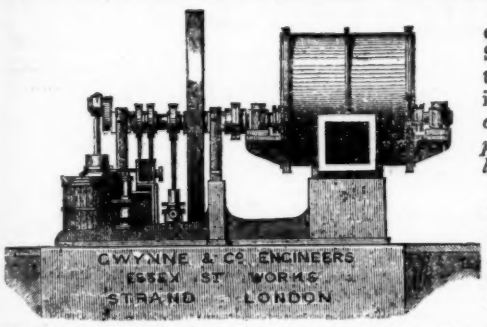
Share List of Metropolitan Gas and Water Companies.

(Corrected by Mr. F. N. Golding, Sun Court, Cornhill, from the latest Stock Exchange Quotations.)

Number of Shares issued.	Amount per Share.	Name.	Amount paid up per Share.	Last Divd. p.Cent. p. Ann.	Latest Quotations.
	£	Gas Companies.	£ s. d	£ s. d	£
16000	20	Anglo-Romano . .	20 0 0	9 0 0	20—22
5000	20	Bahia (Limited). .	20 0 0	2 0 0	14—16
1000	20	Do., do., redeem.	20 0 0	2 0 0	25—27
1500	20	Do., 2nd pref. . .	20 0 0	7 10 0	21—22
40000	5	Bombay (Limited).	5 0 0	7 10 0	7—7¼
10000	5	Do., fourth issue.	4 0 0	7 0 0	5—5½
10000	20	British (Limited) .	20 0 0	10 0 0	41—43
7500	20	Cagliari (Limited).	20 0 0	5 0 0	16—17
5500001.	Sk.	*Commercial* . . .	100 0 0	10 0 0	212—217
70000	100	Do., 7 per cent. .	..	..	150—155
20000	20	Continental Union.	20 0 0	6 0 0	20—22
10000	20	Do., new	12 10 0	6 0 0	par—1
10000	20	Do., preference .	20 0 0	7 0 0	26—28
75000	Sk.	*Crystal Palace District*	100 0 0	10 0 0	212—217
125000	Sk.	Do., 7 per cent. .	100 0 0	7 0 0	150—155
56000	Sk.	Do., preference .	100 0 0	6 0 0	135—140
23406	10	European(Limited)	10 0 0	10 0 0	18—19
12000	10	Do., new shares.	7 10 0	10 0 0	6—7pm.
35406	10	Do., new shares .	5 0 0	10 0 0	4½—5½pm
37977701	Sk.	*Gaslight & Coke* A.	100 0 0	10 0 0	210—213
1600001.	Sk.	Do. B.	100 0 0	4 0 0	85—90
30000	10	Do. 5 per ct. pref. conv.,3rd issue.	all	5 0 0	20½—21
50000	10	Do. do., 4th do. .	6 0 0	5 0 0	9¼–9⅝pm
50000	10	Do. do., 5th do. .	2 0 0	5 0 0	9–9¼ pm.
2000001.	Sk.	Do. C 10 p.c. pref.	100 0 0	10 0 0	230—235
3000001.	,,	Do. D do. do. .	100 0 0	10 0 0	230—235
1650001.	,,	Do. E do. do. .	100 0 0	10 0 0	230—235
300001.	,,	Do. F 5 do. do. .	100 0 0	5 0 0	114—116
600001.	,,	Do. G 7½ do. do. .	100 0 0	7 10 0	165—170
13000001	,,	Do. H	100 0 0	7 0 0	150—153
6200	5	Georgetown,Guiana	5 0 0	5 0 0	..
16000	20	Hong Kong (Lim.)	10 0 0	10 0 0	18¾—19½
56000	50	*Imprl. Continental Gas Association*	43 15 0	9 10 0	85—88
2500001.	Sk.	*London*	100 0 0	10 0 0	213–217*
1500001.	Sk.	Do., 1st pref. . .	100 0 0	6 0 0	138–143*
14450	Sk.	Do., 2nd pref. . .	100 0 0	6 0 0	115—120
4350	Sk.	Do., 3rd pref. . .	100 0 0	6 0 0	115—120
7622	25	Do., A shares . .	12 10 0	6 0 0	34—36
268051.	All	Do., Debent. stk.	100 0 0	5l. & 6l.	..
15000	5	Malta and Mediterranean (Limited).	5 0 0	2 0 0	2–3
6000	5	Do., preference .	5 0 0	7 10 0	5–5½
20000	5	Mauritius(Limited)	2 0 0	..	¼–1
25000	20	Monte Video (Lim.)	20 0 0	8 0 0	18¼–19½
8000	10	Nictheroy, Brazil (Limited)	10 0 0	3 10 0	..
30000	5	Oriental (Calcutta).	5 0 0	9 10 0	8–8½
30000	5	Do., new shares .	3 0 0	9 10 0	2½–2¾pm
10000	5	Ottoman (Limited).	5 0 0	3 0 0	2–3
27000	20	*Phœniz*	20 0 0	10 0 0	43–46
1440001.	Sk.	Do., new	60 0 0	7 10 0	101—106
		Do., capitalized .	100 0 0	5 0 0	105—110
		Do., new, 1876. .	..	..	17–18pm
36000	20	Rio de Janeiro (L.)	20 0 0	10 0 0	31—33
7359	5	Singapore(Limited)	5 0 0	7 10 0	5½—5⅝
2000	5	Do., preference .	5 0 0	7 10 0	5½—6½
1500	32½	Shanghai	32 10 0	12 0 0	30—32
4000	50	*South Metropolitan Gas*	50 0 0	10 0 0	109—112
4000	12½	Do.	12 10 0	10 0 0	27—29
20000	12½	Do., new shares .	10 10 0	10 0 0	12½—13½ pm.
15000	10	*Surrey Consumers.*	10 0 0	10 0 0	20—22
10000	10	Do., new	8 0 0	10 0 0	9–10pm.
					* ex new
9000	4	United General . .	4 0 0	2 10 0	3–3⅛
1500	10	*Wandsw. & Putney*	10 0 0	10 0 0	19—20
1500	10	Do.	10 0 0	7 10 0	11—12
2957	10	Do.	10 0 0	7 0 0	..
993	10	Do.	3 0 0	7 0 0	..
16000	5	*West Ham*	5 0 0	10 0 0	8–8¼
10000	5	Do., new shares .	2 10 0	10 0 0	3–4
		Water Companies.			
12000	100	Chelsea	100 0 0	6 0 0	149—152
1800000	100	East London . . .	100 0 0	6 0 0	158—161
8000	50	Grand Junction . .	50 0 0	5 0 0	77—78
5840	25	Do., ¼ shares . .	25 0 0	5 0 0	38¼—39
2160	25	Do., new ditto; max. div.,7½ p.c.	25 0 0	5 0 0	32—34
547960	100	Kent	100 0 0	8 0 0	194—198
970	100	Lambeth	100 0 0	6 5 0	150—155
1161	100	Do., max., 7½ p.c.	100 0 0	6 5 0	152—155
442	100	New River	100 0 0	7 0 0	270—280
4475	100	Do.	60 0 0	7 0 0	..
400000	100	Do.,deb.sk.,4 p.c.	100 0 0	4 0 0	101—103
3036	100	Southwrk. & Vauxh.	100 0 0	4 0 0	114—117
1296	100	Do., pref. stock .	100 0 0	5 0 0	113—116
..	100	Do., D shares . .	100 0 0	4 0 0	112—115
..	..	Do., 4½ preference	100 0 0	4 10 0	106—108
..	100	Do., new ordinary	..	4 10 0	..
1600	100	Do., new ord. No.1	40 0 0	4 10 0	108—108
12172	61	West Middlesex . .	61 0 0	6l.p.sh.	145—147

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, and TWO MEDALS at the PHILADELPHIA EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS; Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

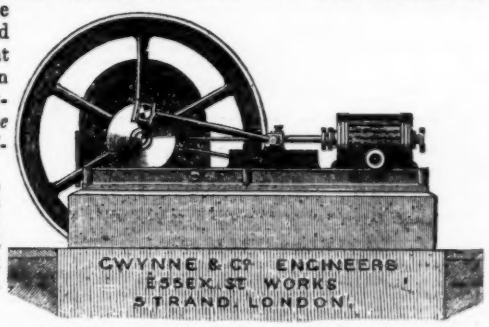
GWYNNE & BEALE'S PATENT GAS-EXHAUSTERS & ENGINES.



EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 7,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



52,500 EXHAUSTER, with Horizontal Engine combined.

GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas without oscillation or variation in pressure. Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers, ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

☞ *G. & Co. are now making 6 Sets Exhausters and Engines for 105,000 cubic feet per hour, 3 Sets 180,000 Exhausters and Engines with many others of all Sizes.*

D. BRUCE PEEBLES & CO.,

ENGINEERS,

FOUNTAINBRIDGE WORKS, EDINBURGH,

MANUFACTURERS OF WET AND DRY GAS-METERS;

Patentees and Sole Manufacturers of "PEEBLES' GAS-GOVERNORS,"

FOR STATIONS, DISTRICTS, DWELLING-HOUSES, AND PUBLIC LAMPS,

OF WHICH UPWARDS OF 90,000 ARE NOW IN SUCCESSFUL USE.

"These Lamp-Governors are so superior that they are likely to supplant all others."—*Dr. Wm. Wallace, F.R.S.E., F.C.S.*

Now ready, price One Shilling, No. 6 (to be continued Monthly) of

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CANNEL COAL FACTOR,

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Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

Mr. Romans has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

Analysis and Prices forwarded on Application.

WANTED, a small Gas-Washer complete, inlet and outlet from 3 to 5 inch.
Address G. DAVIS, Wilmington, HULL.

WANTED, a good practical Retort-SETTER and BRICKLAYER. State age, present and last employment.
Apply, with copies of testimonials, to W. J. WARNER, Engineer, Gas-Works, SOUTH SHIELDS.

WANTED, by a Lancashire Manufacturing Chemist, large or small quantities of strong Gas AMMONIACAL LIQUOR, above 8° Twaddel.
Address No. 353, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a permanent Situation in a Gas-Work, by a young Man, who thoroughly understands all fitting and repairing on and off the works. Eight years at a gas engineer's. Good reference.
Address J. P., 2, Taylor's Buildings, Rochester Row, WESTMINSTER, S.W.

WANTED, an experienced Manager to take charge of the Gas-Works of the Borough of Macclesfield. Annual make about 90 millions. Salary £200 per year. He will be required to devote the whole of his time to the duties, to superintend the main-laying, services, public lamps, and the entire distribution of gas, as well as the manufacturing department.
Applications, in candidate's own hand writing, with recent testimonials, stating age and experience, to be sent in not later than Saturday, the 12th of May, 1877, addressed to the CHAIRMAN of the Gas Committee, MACCLESFIELD, and endorsed, "Application for Gas Manager."

TO GAS APPARATUS MANUFACTURERS.

A Gentleman of good address, who understands the Trade throughout in detail, and has a large and valuable connexion with Gas Companies, Engineers, Managers, &c., is desirous of entering into an arrangement with any respectable Firm wishing to extend their Trade.
Address No. 361, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS COMPANIES.

WE beg to call attention to our special STEATITE BURNERS for Street Lamps. Sample gross 8s. Quotations for quantities.
Messrs. TINDALL AND TELLING, Gas Apparatus Works, 74, Wynford Road, Penton Street, LONDON, N.

TO BE SOLD CHEAP, a 100-Light Gas APPARATUS, by Porter and Co., Lincoln, in excellent condition.
May be seen on application to ROBINSON BROS., Gas-Works, COVENTRY.

GAS-METERS.

FOR SALE, about 100 Gas-Meters (little used).
John Morton, Manager, Gas-Works, Muirkirk, will show the Meters, and offers will be received by JAMES GIBSON, Banker, MUIRKIRK, on or before May 1, 1877.

TO BE SOLD, Four Cast-Iron Purifiers, 6 ft. square, with hydraulic centre-valve; also Ten 18-in. round, and Sixty-two 15-in. round Retort Mouthpieces, and Forty-seven 6-in. H-Pipes.
Apply to W. WINSTANLEY, Manager, Gas-Works, NEWCASTLE-UNDER-LYME.

READING GAS COMPANY.

FOR SALE, as they now stand, and at any reasonable price, as the ground upon which they stand is wanted, four 12-ft. square Cast-Iron PURIFIERS, with centre-valve and connexions, grids, tee bars, &c., complete.
Apply to Mr. E. BAKER, Engineer, Gas-Works, READING.

WALTON-ON-THAMES AND WEYBRIDGE GAS COMPANY.

FOR SALE, Three Engines and Ex-hausters (Two by Gwynne, and one by Waller) for 15,000 feet per hour. Being about to be replaced by larger ones.
Can be seen at the Works, Walton-on-Thames, or particulars can be had of Mr. GEORGE ANDERSON, 35A, Great George Street, WESTMINSTER.

TO GAS COMPANIES AND OTHERS.

THE Dewsbury Corporation, having recently discontinued the use of their Batley Carr Gas-Works, offer FOR SALE the following GASHOLDERS—viz.:
One Telescopic Gasholder, 74 feet diameter, in two lifts of 18 feet deep each, with columns, guides, girders, with balance-weights, &c., all in good condition.
One Telescopic Gasholder, 58 feet diameter, in two lifts of 16 feet deep each, with columns, guides, girders, &c., in first-class condition.
The above Gasholders are suitable for putting in again, and will be sold at most reasonable prices.
Particulars may be had on application to the undersigned,
CHAS. A. CRAVEN, Engineer and Manager.

THE Swansea Gaslight Company have for immediate SALE, the following Plant:—
A 6-h.p. Patent Trunk Engine. (Beale.)
Exhauster to pass 15,000 feet per hour. (Beale.)
An 8-h.p. Grasshopper Engine. (Easton and Amos.)
Exhauster, 20,000 ft. per hour. (Beale.)
Tar, Liquor, and Water Pumps, Eccentrics, Shafting, and Driving Pulleys.
Wrought-iron Condenser, six vertical Legs, 30 ft. high, 24 in. by 6 in., with tar-boxes, dips, and syphons.
A set of four cast-iron Purifiers, 12 ft. square by 5 ft. deep, with galvanized wrought-iron covers, lifting apparatus, four tiers of wooden sieves, 10-in. connexions and valves.
May be seen at the Gas-Works, Swansea. The whole in perfect working order; replaced by plant of larger dimensions.
Further particulars may be obtained on application to Mr. THORNTON ANDREWS, SWANSEA.

GASHOLDERS.

FOR SALE, Two Telescopic Gasholders.
One 50 ft. by 16 ft., the other 70 ft. by 20 ft., each complete, with cast-iron tanks, columns, girders, and inlet and outlet pipes, valves, &c., both of modern construction, in good condition, and made by Messrs. Piggott and Co., of Birmingham. To be seen at work at the Gas-Works, Birkenhead. Cause of removal to make room for extensions.
To be sold a bargain, taken down and re-erected ready for work.
For particulars apply to ASHMORE AND WHILE, STOCKTON-ON-TEES; or to view, apply to Mr. CALLOW, Gas Engineer, BIRKENHEAD.

FOR SALE.

A Set of 8-in. Vertical Condensers, with tar-box and all connexions complete, containing about 180 ft. of pipes.
Also a SCRUBBER, 12 ft. high, 5 ft. diameter, with reversing valve.
The above are nearly new (only been in work six years), and are now removed to make room for larger.
May be seen and price obtained on application to H. and F. BAILEY, Engineers, EAST RETFORD.

THE Newport (Mon.) Gas Company have FOR SALE the following PLANT at their Works, Newport, Mon.:—
Two Cylindrical Boilers, 13 ft. by 4 ft., with fittings complete, and steam-pipes to engines.
Two Horizontal Engines, each cylinder 9½ in. diameter, and stroke of each 1 ft. 6 in.
Two Beale's Exhausters, made to pass 20,000 cubic feet per hour each, with regulators and bye-pass.
The above are in good order, have been working during the past winter, and are now offered for sale because larger ones have been fixed.
They can be seen at the Works, Mill Street, Newport, Mon.
THOMAS CANNING, Engineer.
April 20, 1877.

THE Chepstow Gas Company desire to receive TENDERS for the purchase of their TAR and AMMONIACAL LIQUOR, together or separately.
For particulars and forms of tender, address Mr. WILLIAM DORÉ, Secretary for the Company.

TO TAR DISTILLERS, DYE MANUFACTURERS, AND OTHERS.

THE Directors of the Swansea Gaslight Company are prepared to receive TENDERS for the purchase of the TAR produced at the Gas-Works, Swansea.
For information as to terms and conditions, apply to the undersigned,
THORNTON ANDREWS, Secretary and Manager.
Swansea, April 24, 1877.

TO TAR DISTILLERS AND OTHERS.

THE Directors of the St. Helen's Gas Company are prepared to receive TENDERS for the TAR produced at their Works (into which there is a siding from the London and North-Western Railway), for a term of One or Two years, commencing on the 1st of July next.
Sealed tenders, properly endorsed, to be sent in not later than Wednesday, May 16, addressed to the Secretary, Mr. E. DYSON, Gas Office, St. Helen's, LANCASHIRE.
The Directors do not bind themselves to accept the highest or any tender.

ELLAND-CUM-GREETLAND GAS COMPANY.

THE Directors of this Company are pre-pared to receive TENDERS for the purchase of their surplus TAR and AMMONIACAL LIQUOR, for One or Three years, from the 21st day of November next.
The Directors do not bind themselves to accept the highest or any tender.
Sealed tenders to be sent to the undersigned, from whom all particulars may be obtained, not later than Thursday, the 24th of May.
W. A. WALKER, Secretary, &c., to the Company.
Gas Company's Offices, April 28, 1877.

TO BUILDERS AND CONTRACTORS.

THE Eastbourne Gas Company invite TENDERS for the construction of a GASHOLDER-TANK on their premises at Willingdon, Sussex, 102 ft. diameter and 24 ft. 3 in. deep, in accordance with drawing and specification to be seen at the Office of Alfred Williams, 64, Bankside, S.E., Engineer to the Company.
Tenders to be sent in not later than the 7th of May, to J. H. CAMPION COLES, Esq., EASTBOURNE, endorsed "Tender for Gasholder-Tank."
April 26, 1877.

TO GASHOLDER MAKERS.

THE Eastbourne Gas Company invite TENDERS for the erection of a Single-Lift GASHOLDER, 100 ft. diameter and 24 ft. deep, on their premises at Willingdon, Sussex, in accordance with drawing and specification, to be seen at the Office of Alfred Williams, 64, Bankside, S.E., Engineer to the Company.
Tenders to be sent, endorsed "Tender for Gasholder," not later than the 7th of May next, to J. H. CAMPION COLES, Esq., EASTBOURNE.
April 26, 1877.

TO COAL MERCHANTS, SHIPOWNERS, AND OTHERS.

THE Directors of the Torquay Gas Com-pany are prepared to receive TENDERS for the supply of about 5000 Tons (or such other quantity as may be agreed on) of Pelaw Main, Waldridge, Pelton, New Pelton, Peareth, or other approved GAS COAL. About 600 tons per month to be delivered during June, July, August, September, and October, and the remainder at the rate of about 400 tons per month during the succeeding five months.
Tenders to state the price of Coals and freight to Dartmouth, separately and together, and also for delivery into the Company's Works, free of all charges.
Payment by cash for freight on delivery, and by three months bills for the Coals.
Further particulars to be obtained from Mr. Greenfield, the Manager of the Company, Hollacombe, Paignton, and tenders to be sent to the undersigned on or before the 14th day of May next.
By order,
J. KITSON, Secretary.
Torquay, April 23, 1877.

TENDERS FOR GAS COAL.

THE Bangor Water and Gas Company, Carnarvonshire, invite TENDERS for 1400 tons of the best GAS COAL, to be delivered in such quantities, and at such periods as may be required during the Twelve months ending June 30, 1878.
Parties tendering must give full particulars of the Coal offered, and the colliery from which they propose the supply, to be delivered carriage paid at the London and North-Western Railway Station, Bangor.
Sealed tenders, addressed to the undersigned, will be received until the 15th of May next.
DAVID WHITE, Secretary and Manager.
April 21, 1877.

TENDERS FOR TAR AND AMMONIACAL LIQUOR.

THE Bangor Water and Gas Company, Carnarvonshire, are prepared to receive TENDERS for their surplus TAR and AMMONIACAL LIQUOR, for One, Two, or Three years, from the 1st of June next.
The Company will deliver the Tar and Liquor at the Bangor Railway Station, in iron tanks to be provided by the contractor.
The Company do not bind themselves to accept the highest or any tender.
Particulars may be obtained of the undersigned, and the tenders must be sent to me not later than the 22nd of May next.
DAVID WHITE, Secretary and Manager.

ROCHDALE CORPORATION.

GAS DEPARTMENT.—TENDERS FOR COAL.

THE Gas Committee of the Corporation invite TENDERS for the supply of COAL for One or Three years, to be delivered free in waggons at the Milkstone siding, Rochdale, or at the Gas-Works, in such proportion as the Gas Manager may direct.
Tenders, endorsed "Tender for Coal," must be sent to me on or before the 8th of May next.
All particulars can be obtained from Mr. Patterson, the Manager, Gas-Works, Rochdale.
By order,
ZACH. MELLOR, Town-Clerk.
Town-Hall, Rochdale, April 26, 1877.

ROCHDALE CORPORATION.

THE Gas Committee of the Rochdale Corporation invite TENDERS for certain alterations and renewals of PLANT in their Retort-House.
Plans and specification may be seen at the Gas-Works, and any other information required will be furnished by Mr. Paterson, the Engineer.
Sealed tenders to be sent in to me not later than the 7th of May next.
By order,
ZACH. MELLOR, Town-Clerk.
Town-Hall, Rochdale, April 19, 1877.

TO CHEMICAL MANUFACTURERS, TAR DISTILLERS, AND OTHERS.

THE Chorley Commissioners are pre-pared to receive TENDERS for the purchase of their surplus TAR and AMMONIACAL LIQUOR for One or Three years from the 16th of October next.
The Commissioners will deliver the goods at the Chorley Railway Station into waggons to be provided by the Contractor.
Particulars may be obtained on application to Mr. Thomas Hamer, Gas Manager, Chorley, Lancashire.
The Commissioners do not bind themselves to accept the lowest or any tender.
Sealed tenders to be sent to the undersigned not later than the 15th of May next.
By Order,
RICHARD JACKSON, Solicitor,
Clerk to the Chorley Commissioners.
Dated the 6th of April, 1877.

RIPON CITY GAS-WORKS.

TO GASHOLDER MAKERS.

THE Corporation of Ripon are prepared to receive Plans, Specifications, and Tenders for a Single-lift GASHOLDER, 60 ft. in diameter and 16 ft. deep, with 10-in. valves, syphons, &c.
The plans, specifications, and tenders to be delivered at the Corporation Office, Stammergate, on or before the 16th of May next.
No allowance for plans, &c., and the lowest or any tender will not necessarily be accepted.
Further particulars may be obtained on application to the undersigned.
By order,
ROBERT DARNEY, Manager.
Gas-Works, Ripon, April 21, 1877.

BOROUGH OF HALIFAX.

TO COLLIERY PROPRIETORS.

THE Gas-Works Committee of the Halifax Corporation are prepared to receive TENDERS for the supply of 22,000 tons of GAS COALS and 3000 tons of CANNEL, to be delivered upon the railway siding at their Gas-Works. The whole to be supplied before April 30, 1878.
Specifications and forms of tender may be obtained on application to Mr. Wm. Carr, Engineer, Gas-Works, Halifax, and tenders, properly endorsed, must be sent to me or or before Wednesday, May 16, 1877.
By order,
A. C. FOSTER, Town-Clerk.
Town-Hall, Halifax, April 21, 1877.

BOROUGH OF BURNLEY.

THE Gas Committee of the Corporation are prepared to receive TENDERS for a supply of the best screened GAS COAL and CANNEL for One, Two, or Three years.
The quantities required for the first year will be 14,000 tons of Coal and 3000 tons of Cannel, to be delivered at the Gas-Works Wharf, on the Leeds and Liverpool Canal. For the second and third years the Corporation will expect to be supplied with any additional quantity they may require at the contract price.
Further particulars may be obtained on application to Samuel Petty Leather, Gas Engineer, Burnley, to whom all tenders, endorsed "Tender for supply of Coal and Cannel," must be sent on or before Wednesday, May 9, 1877.
By order,
A. B. CREEKE, Town-Clerk.
Burnley, April 17, 1877.

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LONDON, S.W.,

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GAS APPARATUS.

CONTRACTORS FOR THE

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FOR TOWNS, COUNTRY MANSIONS, &c.

Estimates given free of Charge.

Now ready,

THE GAS & WATER COMPANIES DIRECTORY
FOR THE YEAR 1877,

EDITED BY

CHARLES W. HASTINGS,

8, BUCKINGHAM STREET, ADELPHI, LONDON, W.C.,

CONTAINS

An Alphabetical List of Towns in England having Gas or Water Companies.
Date of Formation of the Company.
If Incorporated under Special Act of Parliament, and the date of such Act or Acts.
If under any of the Limited Liability Acts.
Amount of Share Capital.
Name of Chairman.
Name of Engineer or Manager.
Name of Secretary.
If Let on Lease, Name of Lessee.
If a Private Venture, Name of Owner
If Purchased by the Corporation (and in cases where possible the date of such Purchase), or if the Property of the Local Authorities.
Population of all Towns.
Railway Communication, and the Distance from London.
Special Notice is taken of all the Members of the "British Association of Gas Managers."

THIS WORK IS UNDER THE PATRONAGE OF ALL THE LEADING GAS & WATER ENGINEERS AND SECRETARIES OF THE METROPOLITAN & PROVINCIAL COMPANIES.

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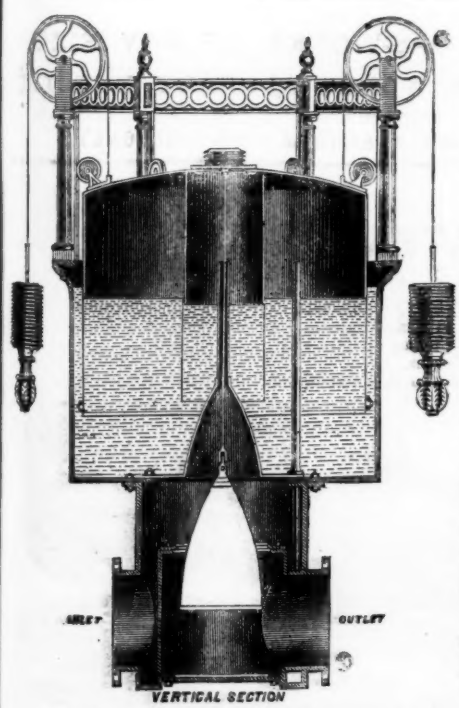
GLOBE METER-WORKS,

OLDHAM,

Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



VERTICAL SECTION

The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

NEWMARKET GAS COMPANY.

THE Directors of this Company invite TENDERS for the laying of the following PIPES, including the total cost of materials (Pipes excepted), excavating, and reinstating the ground—namely, taking up and relaying 900 yards 6-in. Pipes (lead joints), and laying 900 yards 8-in. and 9-in. pipes (turned and bored joints). Average depth 18 inches.

Parties tendering to be prepared to give references.

Further particulars may be obtained on application to the undersigned, to whom tenders are to be sent on or before May 7, 1877.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
THOMAS WILKINSON, Manager and Secretary.
Gas Office, Newmarket, April 20, 1877.

THE Exeter Gaslight and Coke Company are prepared to receive Plans, Specifications, and Tenders for the supply, delivery, and fixing complete of two PURIFIERS, 24 ft. square, 5 ft. deep, with all necessary sieves, 15-in. valves, lifting apparatus, and connexions complete. The two Purifiers to be worked in connexion with two at present in use, and so arranged as to work either the whole four or separately.

Also for two Cast-Iron SCRUBBERS, 40 ft. high and 8 ft. diameter, and prices only for two the same height, but 10 ft. diameter, with all necessary valves and connexions complete.

Contractors to state the time in which they will undertake to complete the respective works.

Separate and sealed tenders for each of the above, marked "Tender," &c., to be sent to me, the undersigned, on or before Saturday, the 12th day of May.

No allowance for plans, &c., nor will the Directors pledge themselves to accept the lowest or any tender.

By order,
W. A. PADFIELD, Secretary.
Gaslight Offices, Exeter, April 19, 1877.

COALS.

THE Richmond (Surrey) Gas Company wish to receive TENDERS for about 6000 Tons of COALS—viz.:

Three thousand Tons of best Inland, either Dodworth, Leversidge, Limehurst, Arley Mine, Wigan Gas Coal, Wharncliffe, Monk Bretton, &c.

Three thousand Tons of Newcastle, either New Pelton, Ravensworth Pelaw, Pelaw Main, or East Pontopp.

To be delivered into the Company's Works (as directed by the Manager), free of all expense, to be weighed by their weighing machine, and paid for accordingly.

Cash monthly.

The Company have a Railway siding about 200 yards from their Works.

If Coals are sent by barge, the nearest point is Mortlake, about one mile from the Works.

Quantities Required.

	Silkstone and Newcastle.
In June	150 Tons each.
In July	200 " "
In August	300 " "
In September	300 " "
In October	450 " "
In November	500 " "
In December	600 " "
In January, 1878	500 " "
Total	3000 Tons each.

Further particulars may be obtained on application to Mr. Eldridge, the Manager.

Sealed tenders, to be addressed to the Chairman of the Richmond Gas Company, on or before the 10th of May, 1877.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
E. B. BLOTT, Secretary.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

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Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 22, Great George Street, WESTMINSTER.

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AND
CONSULTING GAS ENGINEER,
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SPECIAL ACCOUNTANT FOR GAS COMPANIES,
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The Forms of Account, which have been specially designed by A. L. to meet the requirements of the Gas-Works Clauses Amendment Act, 1871, are now in use by many Gas Companies, and have been universally approved.
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Water Companies Accounts also prepared and adjusted.
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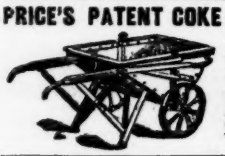
THE Vale of Neath Dinas Fire-Brick and Cement Company, Limited, Pontwalby Works, Glyn Neath, South Wales.
Manufacturers of the Celebrated DINAS FIRE-BRICKS and CEMENT, as supplied to The Gaslight and Coke Company, Beckton, the Imperial Continental Gas Association, &c., &c. Prices and estimates on application.
LONDON AGENCY, 11, Queen Victoria Street, CITY.

PRICE'S PATENT COKE & COAL BARROW



effecting a great saving of time, labour, and expense.
For particulars, price, &c., apply to Mr. E. PRICE, Inventor and Patentee, Gas-Works, Hampton Wick, MIDDLESEX.

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Necessary for the Erection of Retort-Beds.
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CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

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The material is in use at most of the principal Gas-Works in Yorkshire and elsewhere. It contains considerably less moisture than natural Oxide of Iron. It is much cheaper and more efficient as a purifying agent.
B. & H. are purchasers of Spent Oxide, or will take Spent in exchange for New Material.
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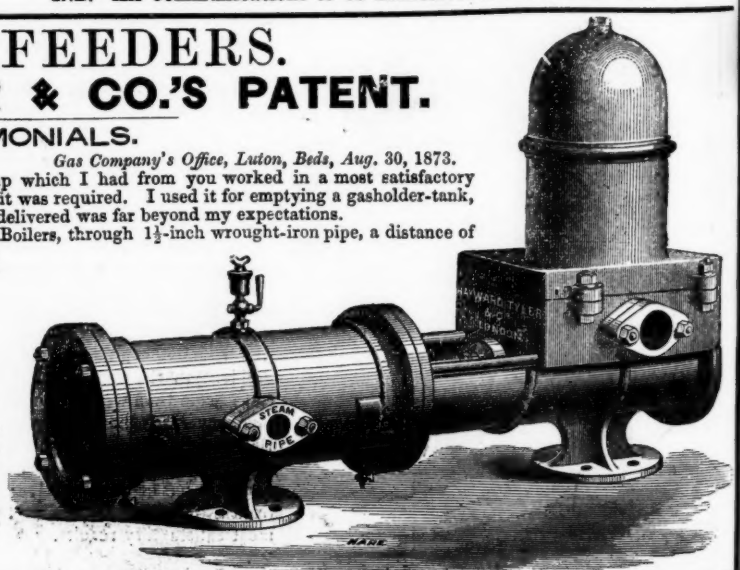
ESTIMATES FOR GAS-WORKS OF ANY SIZE.
REFERENCES TO 500 WORKS ALREADY ERECTED.
N.B.—All Communications to be addressed to the FIRM ONLY.

BOILER FEEDERS.
HAYWARD TYLER & CO.'S PATENT.
TESTIMONIALS.

MESSRS. HAYWARD TYLER AND CO. *Gas Company's Office, Luton, Beds, Aug.* 30, 1873.
GENTLEMEN,—The 9-inch by 6-inch Steam Pump which I had from you worked in a most satisfactory manner, and perfectly answered the purpose for which it was required. I used it for emptying a gasholder-tank, and for refilling it with water. The quantity of water delivered was far beyond my expectations.
Steam was led into it from our Stationary Engine Boilers, through 1½-inch wrought-iron pipe, a distance of about 90 feet; the whole occupied a fitter less than a day, and work commenced without loss of time.—
Yours truly, (Signed) W. PHILLIPS,
Engineer of Luton Gas Company.

Ratcliff Gaslight and Coke Company, New Crane, Wapping, London, July 25, 1872.
MESSRS. HAYWARD TYLER AND CO.
DEAR SIRS,—Have you one of your "Universal" 4-inch by 3-inch Steam Pumps in stock, and how soon could it be delivered? It is for pumping ammonia water, and should have cast-iron clacks. The one I have works capitally.—Yours, in haste,
(Signed) HY. E. JONES.
N.B.—Two more have since been supplied.



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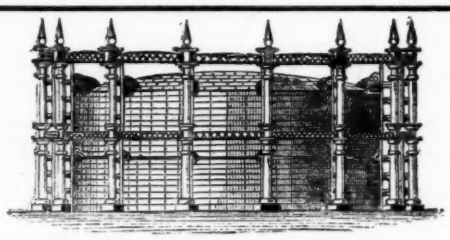

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GAS APPARATUS OF EVERY DESCRIPTION,

Including Improved

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N.B.—Estimates for all Gas Plant and Remodelling supplied on application.

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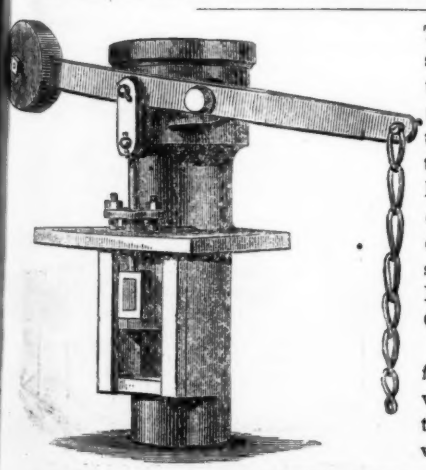

THE advantages of this Dip will be seen from the engraving. It is thoroughly effectual in its working, removing the whole of the pressure of the hydraulic main from the retort, thus causing a great saving in gas. It is very easy of manipulation, requiring little care and attention; it cannot get out of order, and, when shut, works as an ordinary Dip-Pipe. No accumulation of carbon in retort. Can be fixed to existing H-pipes.

In ordering the Dip, the distance from top side of hydraulic main to water-level should be stated; also the Dip at which it is required to work when the valve is shut.

PRICES—3-in., 35s.; 4-in., 42s.; 5-in., 48s.

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PREVENTS WASTE OF GAS FROM RETORTS;

SAVES CLAY RETORTS FROM DESTRUCTION BY FIRE;

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And PREVENTS ALL POSSIBLE LOSS of GAS FROM LEAKAGE.

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GAS AND WATER PIPES.

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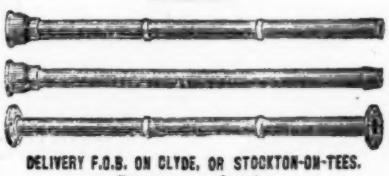

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For Jointing and Repairing Retorts and Ovens both in and out of Action.
Used in the principal London and Provincial Gas-Works as a great aid to the economical production of Gas.
WILLIAM RICHARDSON,
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Is an excellent cleanser of gas from tar, ammonia, sulphur, and carbonic a reducing the cost of subsequent purification 30 to 50 per cent. Needs no mo power or attention beyond drawing off and recharging as required. Has no mov parts or complications to get out of order. Is of moderate cost, and is practic indestructible.
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JOHN HALL AND CO., STOURBRIDGE
Manufacturers of FIRE-BRICKS, LUMPS, TILES,

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N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to m on short Notice.

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BEALE'S IMPROVED PATENT GAS EXHAUSTERS
COMBINED ENGINES AND EXHAUSTERS,
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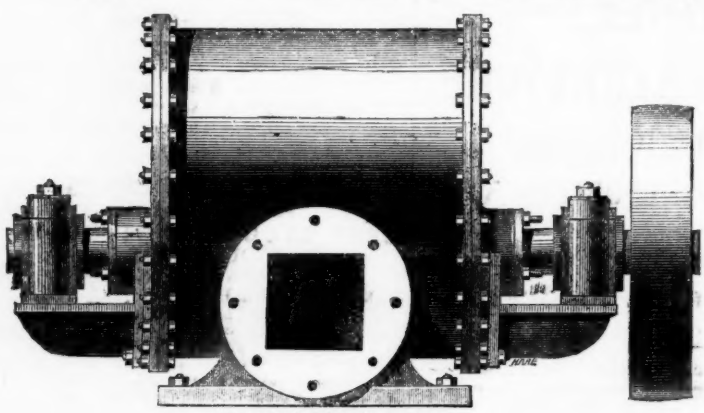
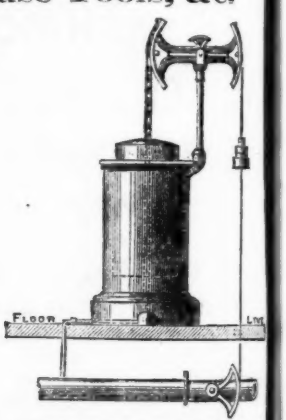
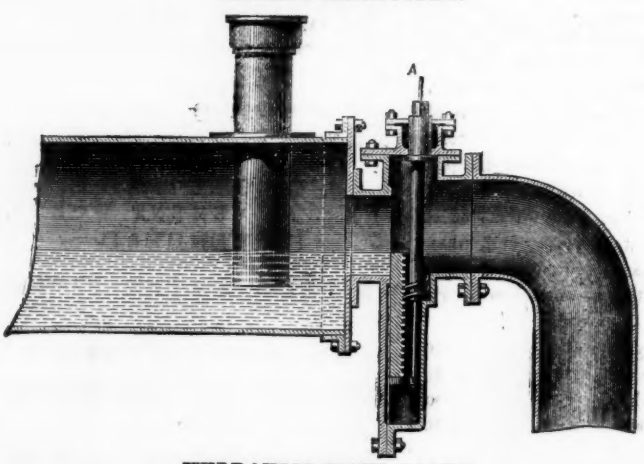
SELF-ACTING BYE-PASS VALVES, HYDRAULIC MAIN VALVES
Hydraulic Coal Lifts, Steam Hoists, Retort-House Tools, &c.

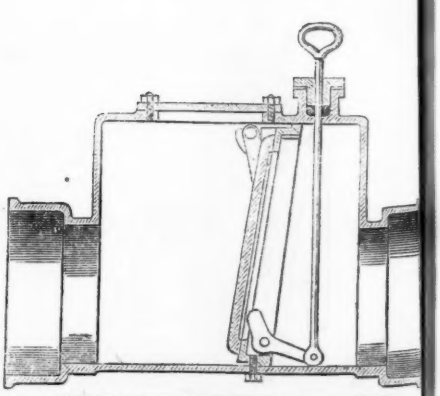

BEALE'S EXHAUSTER.



HYDRAULIC REGULATOR



HYDRAULIC MAIN VALVE.


SELF-ACTING BYE-PASS VALVE.

EXHAUSTERS, VALVES, PUMPS, ENGINES, &c., ALWAYS KEPT IN STOCK.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, SOUTHWARK, S.E.;
AND AT
STROUD, GLOUCESTERSHIRE.

THE WIGAN COAL & IRON COMPANY,

LIMITED,

DISTRICT OFFICE: 97, NEW STREET, BIRMINGHAM; AGENT: W. M'GOWAN;

Supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, &c.

N.B.—The Wigan Coal and Iron Company, Limited, are exclusive owners of the well-known HAIGH HALL AND KIRKLESS HALL GAS COAL COLLIERIES.

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MANUFACTURER OF V WOOD TROUGHING

FOR

PROTECTING AND PRESERVING SERVICE-PIPES.

The Wood Troughing being pickled in creosote or gas tar, and the Service-Pipes laid inside the Trough in a bed of gas tar and sand, pitch, or asphalte, the Pipes will last very considerably longer than if laid in the ordinary way.

Made in Large Quantities, to any Length, by Steam Machinery, at Minimum Cost.

GAS PURIFICATION & CHEMICAL Co., LIMITED.

(Successors to JOHN WILLIAM O'NEILL & CO.,)

Offices—PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.,

CONTRACTORS FOR GAS PURIFICATION BY OXIDE OF IRON.

The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

JOHN WILLIAM O'NEILL, SAMUEL H. JOHNSON, } Joint Managing Directors.

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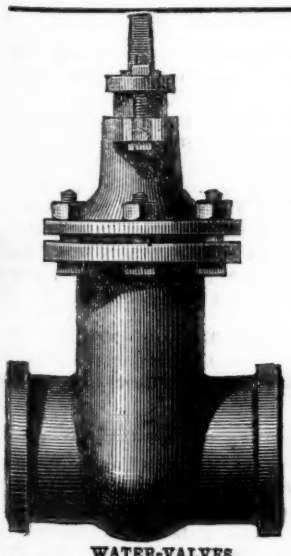
H. O. COOKE & CO.,

OXIDE MERCHANTS,

79, MARK LANE, LONDON, E.C.,

Are now supplying the best natural Oxide of Iron that has yet been brought into the market.



WATER-VALVES.
All Sizes, Flange and Socket, kept in Stock, tested to 1000 feethead.

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ENGINE-WORKS,

GROSVENOR ROAD, PIMLICO,

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SCREW-COCKS, HYDRANTS,

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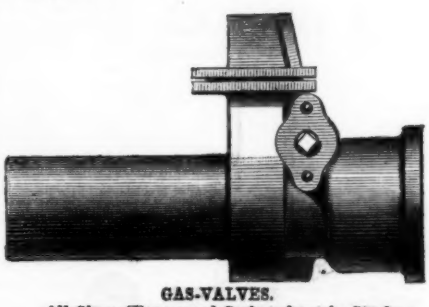
And all other Machinery for

WORKS OF WATER SUPPLY, DRAINAGE AND IRRIGATION.



GAS-VALVES.
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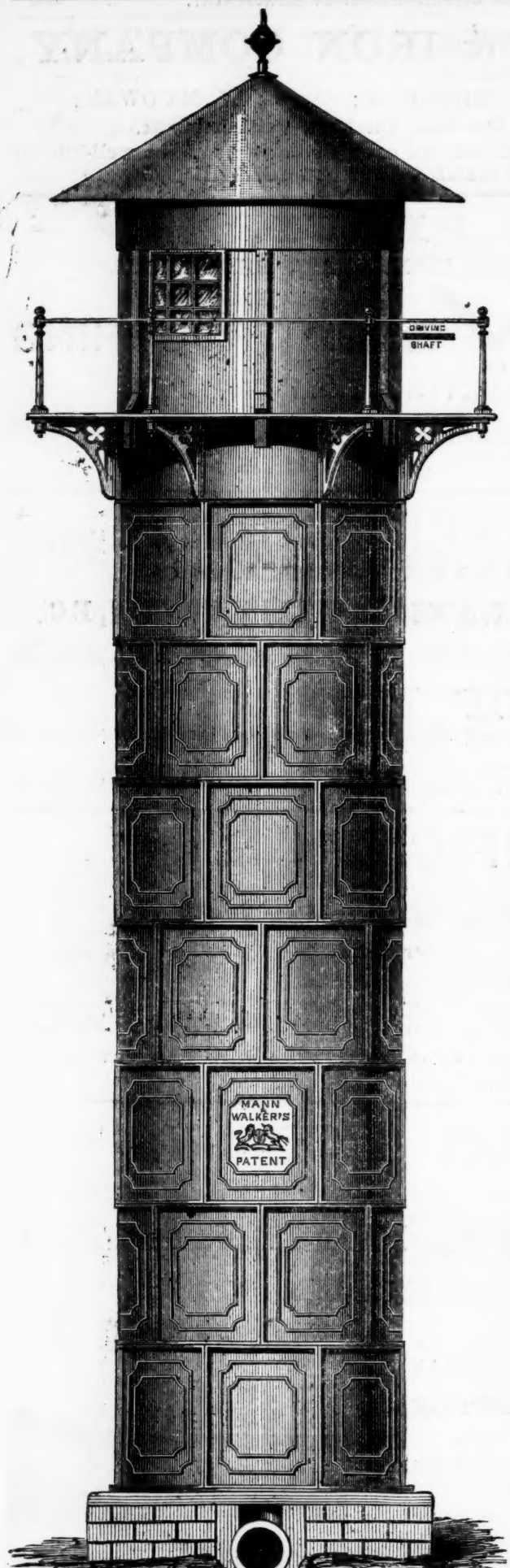


C. & W. WALKER,
8, FINSBURY CIRCUS,
LONDON, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, the number in use exceeds **one hundred,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

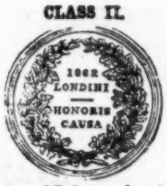
Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.



This Paint having been in general use over fifteen years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (30s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

The following Gas Companies in London have used the Paint for years—viz., The Gaslight and Coke, Imperial, Independent, City of London, Commercial, London, and Surrey Consumers.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs about 20s. per cwt., as compared with White Lead at 30s. per cwt.; a similar economy arises from its use in Steam and Gas Joints, for which purpose it is superior to White Lead.

SPECIAL DRIERS FOR ANTIMONY PAINT SUPPLIED.

JOHN ABBOT AND CO.,

LIMITED,

IRON AND BRASS FOUNDERS,

PARK WORKS, GATESHEAD-ON-TYNE.

London Office: 2, SUFFOLK LANE, CANNON STREET.

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MANUFACTURERS OF ALL DESCRIPTIONS OF

HYDRAULIC MACHINERY,

INCLUDING

ACCUMULATORS, FORCE-PUMPS, CRANES, & LIFTS,

FOR

GAS-WORKS, WAREHOUSES, &c.

IMPROVED HYDRAULIC MACHINERY,

Specially Arranged for Lifting and Lowering Purifier-Covers, &c.

MAKERS OF

PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS;

PIPES FOR GAS AND WATER WORKS;

ROOFS, COLUMNS, AND GIRDERS.

DESIGNS AND ESTIMATES SUPPLIED ON APPLICATION.

ALBERT GAS COAL.

THE DERBYSHIRE

SILKSTONE COAL COMPANY,

LIMITED,

CAN OFFER A

GAS COAL

Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	**10,775**
Weight of coke in lbs. per ton of coal	**1,465**

ANALYSIS AND PRICES ON APPLICATION TO

Mr. EDMUND TAYLOR, Secretary,

ALBERT COLLIERY, NEWBOLD, NEAR CHESTERFIELD.

ROBERT MARSHALL,

CANNEL COAL MERCHANT,

173, ST. VINCENT STREET, GLASGOW.

SHOTT'S BOGHEAD.

LOTHIAN'S CANNEL

Yields 12,500 cubic feet of 24-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full Analyses on application.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

SCOTCH CANNEL COALS.

The Subscriber is prepared to contract for the supply of all the principal SCOTCH CANNEL COALS. Prices and Analyses of the various Coals will be forwarded on application.

JAMES M'KELVIE,

CANNEL COAL MERCHANT,

HAYMARKET, EDINBURGH.

Established 1840.

HEBBURN MAIN GAS COALS.

T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,524 cubic feet per ton of 14½-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9866 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

THE TYNE COAL COMPANY, LIMITED, OWNERS.

W. RICHARDSON, Fitter,

29, QUAYSIDE, NEWCASTLE-ON-TYNE.

WILSON CARTER & PEARSON,

GAS COAL AND CANNEL FACTORS,

Supply to any Railway Station or export Best Wigan Arley Gas Coal and Nuts; best qualities of the Derbyshire, Yorkshire, and North Staffordshire Gas Coals and Nuts; also the best descriptions of Lancashire, Welsh, Scotch, and other Cannel.

Messrs. WILSON CARTER & PEARSON, being contractors to several of the principal Gas Companies in the Midland Counties, have pleasure in being enabled to give them as references.

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ADDISON POTTER,

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NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of

CLAY RETORTS, FIRE-BRICKS, AND EVERY DESCRIPTION OF FIRE-CLAY GOODS

BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT KELLER, GHENT.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communications addressed to J. SUGG & CO., GHENT, will receive immediate attention.

JAMES NEWTON & SONS,

(Established 1820,)

FIRE-BRICK AND TILE MERCHANTS,

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FALCON DOCK, 78 AND 79, BANKSIDE,

SOUTHWARK, LONDON, S.E.,

DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for

GAS AND WATER WORKS.

GEORGE ANDERSON,

GAS AND CONSULTING ENGINEER,

35A, GREAT GEORGE STREET,

WESTMINSTER, S.W.

PATENTEE and MANUFACTURER of the following Inventions:—

RETORT SETTINGS—giving great Economy of Fuel.

STEAM-ENGINES and EXHAUSTERS, FOUR-WAY VALVES.

FUEL-MACHINE, for Compressing Breeze and Tar.

WASHERS, SCRUBBERS, and PURIFIERS, that Economize Space and Cost.

N.B.—Pamphlet, with Eighteen Illustrations of the foregoing, with letterpress on the construction of Gas-Works, post free, 2s. 6d.

S. OWENS & CO.,

WHITEFRIARS STREET, LONDON, E.C.,

HYDRAULIC ENGINEERS,

AND MANUFACTURERS OF

PUMPING MACHINERY of every Description.

SOLE LICENSEES AND MANUFACTURERS FOR GREAT BRITAIN OF

BLAKE'S PATENT STEAM-PUMPS,

More than 10,000 in use,

ESPECIALLY ADAPTED FOR USE IN GAS AND CHEMICAL WORKS, FOR PUMPING TAR, WATER, AMMONIACAL LIQUOR, ACIDS, &c.

The following are some of the prominent advantages of the BLAKE PUMP:—

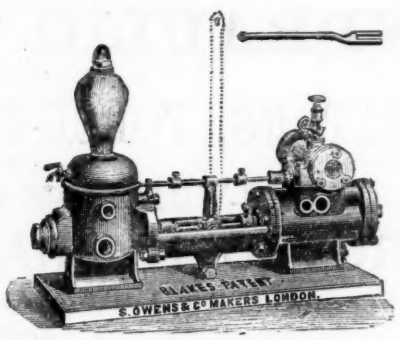
It will start at any point of stroke.

It has no dead point.

It works fast or slow, with the same certainty of action.

It is economical. Has a lead on the slide-valve.

It is compact and durable.



It is interchangeable in all its working parts.

It will deliver more water than any other pump.

It is made of best materials in the most workmanlike manner.

Can be worked at 20 strokes per hour, or 200 strokes per minute.

This Illustration represents Boiler-Feed Pumps, Sizes Nos. 1, 2, *and* 3, *with Hand Lever for working Pump when Steam is not available.*

SOLE MANUFACTURERS OF

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IMPROVED PATENT GAS-VALVES.

PRICED LISTS AND FULL PARTICULARS FURNISHED ON APPLICATION.

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SOLE AGENT FOR

THOMAS BARR'S LESMAHAGOW MAIN CANNEL.

Quotation and Analysis forwarded on application.

G. J. EVESON,

GAS COAL AND CANNEL FACTOR,

Has on offer, and for immediate delivery, in quantities to suit purchasers, Best Yorkshire, Derbyshire, and North Staffordshire Screened and Unscreened Gas Coals and Nuts; also Best Lancashire, Yorkshire, and other Cannel, as supplied by him to some of the principal Gas Companies in England.

Analysis and Prices forwarded on application to

HEAD OFFICES, STOURBRIDGE.

N.B.—Gas Managers will oblige by advising me when they will be prepared to receive Tenders.

THE SILKSTONE & DODWORTH COAL & IRON COMPANY, LIMITED,

DODWORTH, BARNSLEY.

BENJAMIN WHITWORTH, Esq., M.P. . . . . Chairman.
Mr. RICHARD HARTLEY . . . . . Managing Director.

REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON, Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—

"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

THE

WIGAN & WHISTON COAL COMPANY,

LIMITED,

(COLLIERIES—PRESCOT, NEAR LIVERPOOL)

Are now prepared to supply their

RUSBY PARK GAS COAL,

Either to Gas-Works in England or Wales, or for Shipment, at Runcorn, Garston, Birkenhead, or Liverpool.

This Coal is of superior quality, and yields in practical working over 10,000 cubic feet of Purified Gas per ton, with an Illuminating Power of 17½ candles.

One Ton of Coal yields 1441 lbs. of good Coke.

For prices, &c., apply either direct to the Colliery or to the Company's Office,

195, FALKNER STREET, LIVERPOOL.

NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS AND COLLIERIES,

NEAR SHEFFIELD.

CELEBRATED SILKSTONE GAS COALS.

The various descriptions of Gas Coal produced from the above Collieries possess an unequalled reputation, combining in a large degree the constituents essential for the production of the best quality of Coke and Gas of a high illuminating power.

A recent extensive development of the Collieries enables us to offer increased supplies.

JAS. PATERSON, Esq., of Warrington, after testing various qualities of our Coal, has sent the following testimony of their merits:—

"*Warrington Gaslight and Coke Company,*

"*Offices, Mersey Street, Warrington, April* 23, 1877.

"MESSRS. NEWTON, CHAMBERS, AND CO.,

"GENTLEMEN,

"After carefully testing the various samples of Gas Coals sent from your Collieries for analysis, I have pleasure in reporting them as belonging to the highest class of Gas and Coking Coals.

"The average of Nine samples gives a yield of **12,500** cubic feet of **15½** Candle Gas, being equivalent to **664** lbs. of sperm per ton, and **1420** lbs. of fixed carbon of a very superior quality. All the samples bear a close relation to each other in value.

"Yours truly,

"JAMES PATERSON."

Full particulars will be sent on application to us—address as above.

NEW PATENT WET GAS-METER,

THE "RELIANCE,"

MANUFACTURED BY THE

GAS-METER COMPANY, LIMITED,

238, KINGSLAND ROAD, LONDON; UNION STREET, OLDHAM; HANOVER STREET, DUBLIN.

The object attained by this invention is the *correct measurement of Gas under every fluctuation of the pressure.*

Accuracy is obtained by subjecting the whole of the water which determines the measuring chambers of the drum to one uniform even pressure, and so prevents unequal displacements of the water-line.

The "RELIANCE" METER has been tested by several of the most experienced official meter inspectors. Copies of their reports may be obtained on application to the

GAS-METER COMPANY, LIMITED,

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ALEXANDER WRIGHT & CO.,

MANUFACTURERS OF

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OF THE BEST CONSTRUCTION AND MATERIALS,

STATION-METERS AND GOVERNORS,

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AND EVERY DESCRIPTION OF INSTRUMENT FOR TESTING GAS.

PRESSURE REGISTERS AND PRESSURE GAUGES OF ALL KINDS.

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Price Lists on application.

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CONSUMERS IMPROVED WET GAS-METERS,

THE UNVARYING WATER-LINE GAS-METERS,

IMPROVED DRY GAS-METERS, in Cast-Iron or Tin-Plate Cases;

STATION-METERS, ALL SIZES, up to 15 feet Square, with PLANED JOINTS;

Experimental Meters, Photometers, Pressure-Gauges,

Governors, Test Holders, &c., &c.

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London: Printed by WILLIAM BOUGHTON KING (at the office of Clayton and Co. 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, May 1, 1877.